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THE CARE AND FEEDING OF CHILDREN

L. EMMETT HOLT, M. D.

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THE CARE AND FEEDING OF CHILDREN

A CATECHISM FOR THE USE OF MOTHERS AND CHILDREN'S NURSES

BY

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TO

THE YOUNG MOTHERS OF AMERICA,

TOWARD THE SOLUTION OF WHOSE PROBLEMS

THESE PAGES HAVE BEEN DEVOTED,

THIS WORK

IS RESPECTFULLY DEDICATED

BY THE AUTHOR.

PREFACE TO THE SIXTH EDITION

THE constant use of the Catechism as a manual for nursery maids has shown the need of fuller treatment of several subjects than was given in the earlier editions. An attempt has been made to meet the needs of mothers and nurses outside of institutions who have made the book a nursery guide, especially in matters relating to older children.

The author's aim has been not to alarm the mother by acquainting her with all the possible diseases and accidents which may befall her child, but to open her eyes to matters which are her direct and chief concern.

It is, therefore, the needs of the well child, not the sick one, which have been considered. The well child must, in most cases, be left to the care of the mother or nurse for whose guidance and assistance these pages are intended. For directions in matters of illness, however, no mother or nurse should de-

pend upon any manual, but upon the advice of a physician.

It is hoped that the mothers and nurses who have found the earlier editions of the Catechism helpful in the solution of some of their nursery problems will find even greater assistance from the present volume.

New York, 1912

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PART I

THE CARE OF CHILDREN

THE CARE AND FEEDING OF CHILDREN

I

THE CARE OF CHILDREN

BATHING

At what age may a child be given a full tub bath?

Usually when ten days old; it should not be given before the cord has come off.

How should the bath be given?

It should not be given sooner than one hour after feeding. The room should be warm; if possible there should be an open fire. The head and face should first be washed and dried; then the body should be soaped and the infant placed in the tub with its body well supported by the hand of the nurse. The bath should be given quickly, and the body dried rapidly with a soft towel, but with very little rubbing.

At what temperature should the bath be given?

For the first few weeks at 100° F.; later, dur-

ing early infancy, at 98° F.; after six months, at 95° F.; during the second year, from 85° to 90° F.

With what should the bath be given?

Soft sponges are useful for bathing the body, limbs and scalp. There should be a separate wash-cloth for the face and another for the buttocks.

What are the objections to bath sponges?

When used frequently, they become very dirty and are liable to cause infection of the eyes, mouth, or genital organs.

Under what circumstances should the daily tub bath be omitted?

In the case of very feeble or delicate infants on account of the exposure and fatigue, and in all forms of acute illness except by direction of the physician. In eczema and many other forms of skin disease much harm is often done by bathing with soap and water, or even with water alone.

GENITAL ORGANS

How should the genital organs of a female child be cleansed?

Best with fresh absorbent cotton and tepid water, or a solution of boric acid, two teaspoonfuls to the pint. This should be done carefully at least once a

day. If any discharge is present, the boric-acid solution should invariably be used twice a day. Great care is necessary at all times to prevent infection which often arises from soiled napkins.

How should the genital organs of a male child be cleansed?

In infancy and early childhood the foreskin should be pushed completely back at least twice a week while the child is in his bath, and the parts thus exposed washed gently with absorbent cotton and water, afterwards drawn forward again.

If the foreskin is tightly adherent and cannot readily be pushed back, the physician's attention should be called to it. The nurse or mother should not attempt forcible stretching.

When is circumcision advisable?

Usually, when the foreskin is very long and so tight that it cannot be pushed back without force; always, when this condition is accompanied by evidences of local irritation or difficulty in passing water.

EYES

How should the eyes of a little baby be cleansed?

With a piece of soft linen or absorbent cotton

and a lukewarm solution of salt or boric acid,—one even teaspoonful to one pint of water.

If pus appears in the eyes, what should be done?

They should be cleansed every hour with a solution of boric acid (ten grains to one ounce of water). If the lids stick together, a little vaseline from a tube should be rubbed upon them at night. If the trouble is slight, this treatment will control it; if it is severe, a physician should be called immediately, as delay may result in loss of eyesight.

MOUTH

How is an infant's mouth to be cleansed?

An excellent method is by the use of a swab made by twisting a bit of absorbent cotton upon a wooden toothpick. With this the folds between the gums and lips and cheeks may be gently and carefully cleansed twice a day unless the mouth is sore. It is not necessary after every feeding. The finger of the nurse, often employed, is too large and liable to injure the delicate mucous membrane.

What is sprue?

It appears on the lips and inside the cheeks like little white threads or flakes. It is also called thrush.

In bad cases it may cover the tongue and the whole of the inside of the mouth.

How should a mouth be cleansed when there is sprue?

It should be washed carefully after every feeding or nursing with a solution of borax or bicarbonate of soda (baking soda), one even teaspoonful to three ounces of water, and four times a day the boric-acid solution mentioned on previous page should be used.

SKIN

How should the infant's skin be cared for to prevent chafing?

First, not too much nor too strong soap should be used; secondly, careful rinsing of the body; thirdly, not too vigorous rubbing, either during or after the bath; fourthly, the use of dusting powder in all the folds of the skin,—under the arms, behind the ears, about the neck, in the groin, etc. This is of the utmost importance in very fat infants.

If the skin is very sensitive and chafing easily produced, what should be done?

No soap should be used, but bran or salt baths given instead.

How should a bran bath be prepared?

One pint of wheat bran should be placed in a bag of coarse muslin or cheese-cloth, and this put in the bath water. It should then be squeezed for five minutes, until the water resembles a thin porridge.

How should a salt bath be prepared?

A teacupful of common salt or sea salt should be used to each two gallons of water.

How should the buttocks be cared for?

This is the most common place for chafing, as the parts are so frequently wet and soiled; hence the utmost pains should be taken that all napkins be removed as soon as they are wet or soiled, and the parts kept scrupulously clean and well powdered.

If the parts have become chafed, what should be done?

Only bran and salt baths should be used, and in very severe cases even these may have to be omitted for a day or two. The parts may be cleansed with sweet oil and a little absorbent cotton, and the skin kept covered with a dusting powder composed of starch two parts, boric acid one part.

What is prickly heat, and how is it produced?

It consists of fine red pimples, and is usually caused by excessive perspiration and the irritation of flannel underclothing.

How should it be treated?

Lighter clothing should be used; muslin or linen should be put next to the skin; the entire body should be sponged frequently with equal parts of vinegar and water, and plenty of the starch and boric-acid powder mentioned should be used.

CLOTHING

What are the most essential things in the clothing of infants?

That the chest should be covered with soft flannel, the limbs well protected but not confined, and the abdomen supported by a broad flannel band, which should be snug but not too tight. It is important that the clothing should fit the body. If it is too tight it interferes with the free movements of the chest in breathing, and by pressing upon the stomach sometimes causes the infant to vomit soon after swallowing its food. If the clothing is too loose it is soon thrown into deep folds or bunches, which cause much discomfort. No pins should be used, but, instead, all bands about the body should be basted. The petticoats should be supported by shoulder straps.

How should the infant be held during dressing and undressing?

Nothing is more awkward than to attempt to dress a young baby in a sitting posture. It should lie upon the nurse's lap until quite old enough to sit alone, the clothing being drawn over the child's feet, not slipped over the head.

Of what use is the band?

It protects the abdomen, but its most important use is to support the abdominal walls in very young infants, and in this way to prevent the occurrence of rupture.

How long is this band required?

The snug flannel band, not usually more than three or four months. In healthy infants with plenty of fat this may then be replaced by the knitted band, which may be worn up to eighteen months. The band is an important article of dress in the case of thin infants whose abdominal organs are not sufficiently protected by fat. With such, or with those prone to diarrhœa, it is often advisable to continue the band until the third or fourth year.

What changes are to be made in the clothing of infants in the summer?

Only the thinnest gauze flannel undershirts should be worn, and changes in temperature should

be met by changes in the outer garments. The greatest care should be taken that children are not kept too hot in the middle of the day, while extra wraps should be used morning and evening, especially at the seashore or in the mountains.

Should older children be allowed to go with their legs bare?

If strong and well there is no objection to this in hot weather. In cold weather, however, it is doubtful if any children are benefited by it, particularly in a changeable climate like that of New York. Many delicate children are certainly injured by such attempts at hardening.

What sort of underclothing should be worn during cold weather?

Never the heaviest weight, even in winter. Four grades are usually sold, the next to the heaviest being thick enough for any child.

Do little children require as heavy flannels as older people?

Not as a rule. They usually live in a warm nursery; their circulation is active; and they always perspire easily during their play. When they go out of doors, the addition of coats and leggings renders thick flannels unnecessary.

Are not many little children clothed too thinly for the ordinary house?

Very few. The almost invariable mistake made in city homes is that of excessive clothing and too warm rooms. These two things are among the most frequent reasons for their taking cold so easily.

NAPKINS

How should napkins be taken care of?

They should be immediately removed from the nursery when soiled or wet. Soiled napkins should be kept in a receptacle with a tight cover, and washed as soon as possible.

Should napkins which have been only wet be used a second time without washing?

It is no doubt better to use only fresh napkins, but there is no serious objection to using them twice unless there is chafing of the skin. Clean napkins, changed as soon as wet or soiled, are of much importance in keeping the skin healthy.

What are the important things to be observed in washing napkins?

Soiled napkins should not be allowed to dry, but should receive a rough washing at once; they should

then be kept in soak in plain water until a convenient time for washing,—at least once every day,—when they should be washed in hot suds and boiled at least fifteen minutes. Afterward they should be very thoroughly rinsed or they may irritate the skin, and ironed without starch or blueing. They should never be used when damp.

NURSERY

What are the essentials in a good nursery?

The furnishings should be very simple, and unnecessary hangings and upholstered furniture should be excluded. As large a room as possible should be selected—one that is well ventilated, and always one in which the sun shines at some part of the day, as it should be remembered that an average child spends here at least three fourths of its time during the first year. The nursery should have dark shades at the windows, but no extra curtains; about the baby's crib nothing but what can be washed should be allowed. The air should be kept as fresh and as pure as possible. There should be no plumbing, no drying of napkins or clothes, no cooking of food, and no gas burning at night. A small wax night-light answers every purpose.

How should a nursery be heated?

Best by an open fire; next to this by a Franklin stove. The ordinary hot-air furnace of cities has many objections, but it is not so bad as steam heat from a radiator in the room. A gas stove is even worse than this, and should never be used, except, perhaps, for a few minutes during the morning bath.

At what temperature should a nursery be kept during the day?

Best, 64° to 68° F., measured by a thermometer hanging three feet from the floor. The temperature should not be allowed to go above 70° F.

At what temperature during the night?

During the first two or three months, not below 65° F. After three months the temperature may go as low as 55° F. After the first year it may be 50° or even 45° F.

At what age may the window be left open at night?

Usually after the third month, except when the outside temperature is below freezing point.

How often should the nursery be aired?

At least twice a day—in the morning after the child's bath, and again in the evening before the child is put to bed for the night. This should be

done thoroughly, and the child should be removed meanwhile to another apartment. It is well to air the nursery whenever the child is out of the room.

What symptoms are seen in a child who is kept in too hot a room?

It becomes pale, loses appetite, shows symptoms of indigestion, occasionally vomits, stops gaining in weight, perspires very much, and takes cold easily because of this and also because of the great difference between the indoor and outdoor temperatures. Its condition may be such as to lead one to suspect very serious illness.

AIRING

How early may airing indoors be commenced and how long may it be continued?

Airing in the room may be begun with a strong, healthy child, even in cold weather, when he is one month old, at first for only fifteen or twenty minutes at a time. This period may be gradually lengthened by ten or fifteen minutes each day until it is four or five hours. This airing may be continued in almost all kinds of weather.

Is there not great danger of a young baby's taking cold when aired in this manner?

Not if the period is at first short and the baby accustomed to it gradually. Instead of rendering the child liable to take cold, it is the best means of preventing colds.

How should such an airing be given?

The child should be dressed with bonnet and light coat as if for the street and placed in its crib or carriage which should stand a few feet from the window. All the windows are then thrown wide open, but the doors closed to prevent draughts. Screens are unnecessary.

At what age may a child go out of doors?

In summer, when one week old; in spring and fall, usually at about one month; in winter, when about three months old, but only on pleasant days, being kept in the sun and out of the wind.

What are the best hours for airing out of doors?

In summer and early autumn a child may be out almost any time between seven in the morning and sunset; in winter and early spring, a young child only between 10 or 11 A. M. and 3 P. M., although this depends somewhat upon the climate. In New

York and along the Atlantic coast the early mornings are apt to be damp and the afternoons raw and cloudy.

On what kind of days should a baby not go out?

In sharp winds, when the ground is covered with melting snow, and when it is extremely cold. A child under four months old should not usually go out if the thermometer is below freezing point; nor one under eight months old if it is below 20° F.

Exceptions to all the above statements are to be made in the case of very small and especially delicate infants. Though they should have fresh air in abundance, they should be much more carefully protected against cold.

What are the most important things to be attended to when the child is out in its carriage?

To see that the wind never blows in its face, that its feet are properly covered and warm, and that the sun is never allowed to shine directly into its eyes when the child is either asleep or awake.

Of what advantage to the child is going out?

Fresh air is required to renew and purify the blood, and this is just as necessary for health and growth as proper food.

What are the effects produced in infants by fresh air?

The appetite is improved, the digestion is better, the cheeks become red, and all signs of health are seen.

Is there any advantage in having a child take its airing during the first five or six months in the nurse's arms?

None whatever. A child can be made much more comfortable in a baby carriage, and can be equally well protected against exposure by blankets and the carriage umbrella.

What are the objections to an infant's sleeping out of doors?

There are no real objections. It is not true that infants take cold more easily when asleep than awake, while it is almost invariably the case that those who sleep out of doors are stronger children and less prone to take cold than others.

What can be done for older children who take cold upon the slightest provocation?

They should be kept in cool rooms, especially when asleep. They should not wear such heavy clothing that they are in a perspiration much of the time. Every morning the body, particularly the

neck, chest, shoulders and back, should be sponged with cold water (50° to 60° F.).

How should this cold sponge bath be given?

The child should stand in a tub containing a little warm water, and a large bath sponge filled with cold water should be squeezed two or three times over chest and shoulders. For best effects this sponge bath should be very cold and very short. It should be followed by a vigorous rubbing with a towel until the skin is quite red. This may be begun at three years, and often at two years. For infants a little higher temperature (65° to 70° F.) may be used.

WEIGHT, GROWTH, AND DEVELOPMENT

Of what importance is the weight of the child?

Nothing else tells so accurately how well it is thriving.

During the first year a record of the weight is almost indispensable; throughout childhood it is of much interest and is the best guide to the physical condition. It will well repay any mother or nurse to keep such a record.

How frequently should a child be weighed?

Every week during the first six months, and at least once in two weeks during the last six months

of the first year. During the second year a child should be weighed at least once a month.

How rapidly should an infant gain in weight during the first year?

There is usually a loss during the first week of from four to eight ounces; after this a healthy child should gain from four to eight ounces a week up to about the sixth month. From six to twelve months the gain is less, usually from two to four ounces a week.

Is it to be expected that bottle-fed infants will gain as rapidly as those who are nursed?

They seldom do so during the first month; after that time under favourable circumstances the gain is usually quite as regular, and during the latter half of the first year it is likely to be more continuous than in a nursing infant, because the latter usually loses weight at the time of weaning.

Why do they not gain so rapidly at first?

It takes a few weeks for the stomach to become accustomed to cow's milk, and until this is accomplished it is necessary to make the milk very weak or the child's digestion will be upset.

For a child of average weight at birth (seven to seven and a half pounds) what should be the weight at the different periods during the first year?

At three months it should be twelve to thirteen pounds; at six months, fifteen to sixteen pounds; at nine months, seventeen to eighteen pounds; at one year, twenty to twenty-two pounds. At five months an average healthy child has doubled its weight, and at twelve months it has nearly trebled its weight.

Do all healthy infants gain steadily in weight during the first year?

As a rule they do; yet it is seldom the case that one gains every week for the entire year. With most infants there are from time to time periods of a few weeks in which no gain is made. These are more often seen from the seventh to the tenth month and frequently occur when the child is cutting teeth, sometimes during very hot weather.

Is it true that every infant who gains rapidly in weight is thriving normally?

Not invariably. Some who are fed upon prepared infant foods increase rapidly in weight but not in strength, nor in their development in other respects.

Is the weight of as much value in the second year as a guide to the child's condition?

After the first year, the gain in weight is seldom continuous; there are many interruptions, some depend on season, and others often occur without apparent cause.

At what age should the fontanel close?

The average is about eighteen months. It seldom closes earlier than fourteen months, and it should not be open at two years.

At what age should a child hold up its head?

As a rule during the fourth month, and often during the third month, the head can be held erect when the body is supported.

When does an infant first laugh aloud?

Usually from the third to the fifth month.

When does it begin to reach for toys and handle them?

Usually from the fifth to the seventh month.

At what age should a child be able to sit and to stand alone?

At seven or eight months a healthy child is usually able to sit erect and support the body. During the ninth and tenth months are usually seen the first attempts to bear the weight upon the feet, and at

eleven or twelve months most children can stand with assistance.

When should a child walk alone?

The first attempts are generally seen in the twelfth or thirteenth month. At fifteen or sixteen months the average child is able to run alone.

What conditions postpone these events?

Prematurity, a very delicate constitution, any severe or prolonged illness, and especially chronic disturbances of digestion making feeding difficult. A common cause of late sitting, standing, or walking is rickets.

Should a child be urged to walk?

Never; he is usually quite willing to do so as soon as his muscles and bones are strong enough. None of the contrivances for teaching children to walk are to be advised.

When do children begin to talk?

Generally at one year a child can say "papa" and "mamma" or other single words. At the end of the second year the average child is able to put words together in short sentences.

If at two years the child makes no attempt to speak, what should be suspected?

Either that the child is a deaf-mute or that it is

mentally deficient, although this is occasionally seen in children who are in other respects quite normal.

Table showing the Average Weight, Height, and Circumference of Head and Chest of Boys[1]

At birth	Weight	7½ pounds
	Height	20½ inches.
	Chest	13½ "
	Head	14 "
One year	Weight	21 pounds.
	Height	29 inches.
	Chest	18 "
	Head	18 "
Two years	Weight	27 pounds.
	Height	32 inches.
	Chest	19 "
	Head	19 "
Three years	Weight	32 pounds.
	Height	35 inches
	Chest	20 "
	Head	19¼ "
Four years	Weight	36 pounds.
	Height	38 inches.
	Chest	20¾ "
	Head	19¾ "
Five years	Weight	41 pounds.
	Height	41½ inches.
	Chest	21½ "
	Head	20½ "

[1] Weights for the first four years are without clothes.

The weight of girls is on the average about one pound less than boys. They are about the same in height.

Charts showing weight curve for the first year, and from one year to fourteen years are given at the end of this book.

Six years	Weight	45 pounds.
	Height	44 inches.
	Chest	23 "
Seven years	Weight	49½ pounds.
	Height	46 inches.
	Chest	23½ "
Eight years	Weight	54½ pounds.
	Height	48 inches.
	Chest	24½ "
Nine years	Weight	60 pounds.
	Height	50 inches.
	Chest	25 "
Ten years	Weight	66½ pounds.
	Height	52 inches.
	Chest	26 "

The above weights are with ordinary house clothes.

DENTITION

How many teeth are there in the first set?

Twenty.

What is the time of their appearance?

The two central lower teeth are usually the first to appear, and come from the fifth to the ninth month; next are the four upper central teeth, which come from the eighth to the twelfth month. The other two lower central teeth and the four front double teeth come from the twelfth to the eighteenth month. Then follow the four canine teeth, the two upper ones being known as the "eye teeth," and the

two lower as the "stomach teeth"; they generally come between the eighteenth and the twenty-fourth month. The four back double teeth, which complete the first set, come between the twenty-fourth and thirtieth month.

At one year a child usually has six teeth.

At one and a half years, twelve teeth.

At two years, sixteen teeth.

At two and a half years, twenty teeth.

What are the causes of variation?

The time of appearance of the teeth varies in different families; in some they come very early, in others much later. The teeth may come late as a result of prolonged illness and also from rickets.

What symptoms are commonly seen with teething?

In healthy children there is very often fretfulness and poor sleep for two or three nights; there may be loss of appetite, so that only one half the usual amount of food is taken; there is salivation or drooling, and often slight fever; there may be some symptoms of indigestion, such as vomiting or the appearance of undigested food in the stools. In delicate children all these symptoms may be much more severe.

How long do these symptoms last?

Usually only three or four days; but there may be no gain in weight for two or three weeks.

What is the cause of most of the other symptoms attributed to teething?

Nearly all of them come from indigestion due to bad feeding.

PART II

INFANT FEEDING

II

INFANT FEEDING

What is the best infant food?
Mother's milk.

Of what is mother's milk composed?
Thirteen parts solids and eighty-seven water.

What are the solids?
Fat, sugar, proteids, and salts.

What is the fat?
The cream.

What is the sugar?
It is lactose, or milk sugar.

What are the proteids?
The curd of the milk.

Are all these elements necessary?
Yes; we cannot expect to rear a healthy infant unless they are all in his food.

Of what use is the fat?
It is needed for the growth of bones, nerves, the fat of the body, and the production of heat.

Of what use is the sugar?

It is needed for the production of heat, and to make fat in the body.

Of what use are the proteids?

They are needed for the growth of the body cells, such as those of the blood, the organs, and the muscles.

Of what use are the salts?

Particularly for the growth of bone.

Of what use is the water?

By means of the water the food is kept in a state of minute subdivision or in solution, so that the delicate organs of the infant can digest it. It is also necessary to enable the body to get rid of its waste.

NURSING

Why should mothers nurse their children?

First, because there is no perfect substitute for good breast-feeding. Secondly, statistics show that the mortality of bottle-fed infants during the first year is fully three times as great as that of those who are breast-fed.

At what period is nursing of greatest importance?

During the first three or four months, to give the

child a proper start. At this time of life the mortality is highest and artificial feeding is most difficult.

When should maternal nursing not be attempted?

If the mother has or has had tuberculosis or any other serious chronic disease, or is herself in very delicate health, she should not try. She is likely soon to fail in nourishing her child, and the attempt may do herself much harm as well as injure the child.

How often should infants be nursed during the first two days of life?

Usually only four or five times daily, since there is very little milk secreted at this time.

When does the milk come in abundance?

Usually on the third day, sometimes not until the fourth or fifth day.

Should the infant be fed anything additional during the first two days?

Usually not; if much food were necessary, we may be sure Nature would have provided it. Water, however, should be given regularly.

How frequently should an infant be nursed during the first week?

After the third day, every two hours during the day and twice during the night. The frequency

during the entire first year is given in the following table:

Period.	Nursings in 24 hours.	Interval by day.	Night nursings (10 P.M. to 6 A.M.)
1st and 2d day.....	4	6 hours.	1
3 days to 4 weeks...	10	2 "	1
4 weeks to 2 months.	8	2½ "	1
2 to 5 months.....	7	3 "	1
5 to 12 months.....	6	3 "	0

How long should the child be kept at the breast for one nursing?

Not over twenty minutes.

Should the child take both breasts at one nursing?

If the milk is very abundant one breast may be sufficient, otherwise both breasts may be taken.

What are the important things to be attended to in nursing?

First, regularity; it is just as important as in the case of bottle-feeding. Secondly, the nipples should be kept clean by being washed after every nursing.

What should be the diet of a nursing mother?

She should have a simple but generous diet with plenty of fluids; three regular meals may be given, and gruel, milk, or cocoa at bed-time and sometimes between meals. She may take eggs, cereals, most

soups, and nearly all vegetables, avoiding sour fruits, salads, pastry, and most desserts. Meat should not be taken more than twice daily, and in many cases but once. She should take but little tea or coffee, and ordinarily no wine or beer.

Are fruits likely to disturb a nursing infant?

Sour fruits in some cases may do so, but sweet fruits and most cooked fruits are useful.

What else is important in the life of the nursing mother?

She should lead a simple natural life; should have regular out-of-door exercise, preferably walking or driving, as soon after her confinement as her condition will permit. She should have regular movements from the bowels daily. She should be as free as possible from unnecessary cares and worry; her rest at night should be disturbed as little as possible; she should go to bed early and lie down for at least one hour in the middle of the day.

Does the nervous condition of the mother affect the milk?

Very much more than her diet; worry, anxiety, fatigue, loss of sleep, household cares, social dissipation, etc., have more than anything else to do with the failure of the modern mother as a nurse. Uncontrolled emotions, grief, excitement, fright, passion,

may cause milk to disagree with the child; at times they may excite acute illness, and at other times they may cause a sudden and complete disappearance of the milk.

Does menstruation affect the milk?

In nearly all cases the quantity of milk is lessened so that the infant is not satisfied and may gain less in weight or not at all. In many cases the quality of the milk is also affected to such a degree as to cause slight disturbances of digestion, like restlessness, colic, or some derangement of the bowels. In a few, attacks of acute indigestion are excited.

Is the return of menstruation a reason for stopping nursing?

Not invariably; as a rule both functions do not go on together. But if the child is gaining regularly in weight between the periods, nursing may be continued indefinitely, although it may be well to feed the infant wholly or in part during the first day or two that the mother is unwell.

What symptoms indicate that a nursing infant is well nourished?

The child has good color, sleeps two or three hours after nursing, or, if awake, is quiet, good-natured, and apparently comfortable. It has normal movements of the bowels and gains weight steadily.

What symptoms indicate that a child who is nursing is not properly nourished?

It does not gain and may even lose in weight. It no longer exhibits its usual energy and playfulness, but is either listless and indifferent or cross, fretful and irritable, and is apt to sleep poorly. It grows pale and anæmic and its tissues become soft and flabby. When the milk is scanty it will often nurse a long time at the breasts, sometimes three quarters of an hour, before stopping. At other times it may take the breast for a moment only, and then turn away in apparent disgust.

What should be done in such cases?

This depends upon the severity of the symptoms and how long they have lasted. If the child has made no gain for several weeks, or is losing weight, immediate weaning will probably be necessary; in any case, other food in addition to the breast milk should be given at once. One may begin by alternating the nursing and the bottle-feeding and increase the number of bottle-feedings as may be indicated by the results, or one may nurse as before and give a smaller bottle-feeding after the child is taken from the breast. A scanty secretion is likely to be still further reduced by lessening the number of nursings, while more frequent nursings tend to increase the flow.

Is there any objection to a baby being partly nursed and partly fed?

None whatever; it is often better from the outset to feed the baby during the night, in order not to disturb the mother's rest. If the mother has only milk enough for two or three nursings a day, this should be continued so long as her milk agrees with the baby. Even a small amount of good breast milk greatly improves a child's nutrition.

What symptoms indicate that the mother's milk disagrees with the child?

The child suffers from almost constant discomfort; sleeps little and then restlessly, cries a great deal, belches gas from the stomach, and passes much by the bowels, or if not passed, the gas accumulates and causes abdominal distention and colicky pain. There may be vomiting, but more often the trouble is intestinal. Sometimes the bowels are constipated, but usually the movements are frequent, loose, green, contain mucus and are passed with much gas.

What should be done under these circumstances?

If the symptoms have persisted for two or three weeks and the child is not gaining in weight, there is little chance of improvement, and the child should be taken from the breast at once. If there is some

gain in weight, one may try for a little longer, endeavouring to improve the mother's milk by rest, fresh air, careful diet, etc. However, one should realize that the trouble is nearly always with the milk, not with the child.

What changes should be made if a nursing infant habitually vomits?

If this occurs soon after nursing, the infant has usually taken too much and the time of nursing should be shortened, or one breast may be given instead of two; the nursing should also be interrupted by occasional rests, so that the milk is not taken too fast.

If the vomiting occurs some time after nursing and is repeated, it is a sign of indigestion; often because the milk is too rich in fat. The intervals between nursings should be lengthened to three or even four hours; the breast milk may be diluted by giving one or two tablespoonfuls of plain boiled water, lime-water, or barley-water, five or ten minutes before nursing; the mother should eat less hearty food, especially less meat. If the child is thriving and gaining regularly in weight the vomiting will in most cases gradually improve with the changes in régime mentioned; but if the child is losing weight weaning is usually advisable.

What should be done if the infant has frequent habitual colic?

The mother should take more out-of-door exercise, eat less meat, and seek to control her emotions; all causes of worry should be removed. If the constipation which accompanies this condition is relieved, the colic will usually disappear also.

Can constipation in a nursing infant be controlled through the mother's milk?

Only to a limited extent. It is important that the mother's bowels be regular and her digestion good. An increase in the meat and milk of her diet is sometimes beneficial.

What should be done when a nursing infant refuses to take the breast?

If this occurs suddenly in a child who has previously nursed well, it is usually a symptom of acute illness; but if a child gradually takes less and less until finally it will not nurse at all, one may be certain, if the child does not appear ill, that there is little or no milk in the breasts.

WEANING

At what age should the child be weaned from the breast?

Usually weaning should be begun at nine or ten

months by substituting one feeding a day for one nursing, later two feedings, and thus gradually the child is to be taken from the breast altogether.

What is the principal reason for weaning earlier?

The most important one is that the child is not thriving—not gaining in weight and not progressing normally in its development. Serious illness of the mother, or pregnancy, may make weaning necessary.

At what age should the weaning be completed?

Generally at one year. In summer it may sometimes be advisable to nurse an infant a little longer rather than wean in warm weather; but even then the dangers of weaning are much less than those of continuing to nurse, as is so often done, after the milk has become very scanty and poor in quality.

When should a child who is weaned from the breast be taught to drink from the cup, and when to take the bottle?

If weaning is done as early as the eighth or ninth month it is better to give the bottle; if from the tenth to the twelfth month the infant should be taught to drink or be fed with a spoon.

How may some of the difficulties in weaning be overcome?

By feeding every nursing infant once a day or

by giving it water regularly from a feeding-bottle. It then becomes accustomed to the bottle. This is a matter of great convenience during the whole period of nursing when the mother or nurse may from necessity be away from the child for a few hours; when more feeding is required at the time of weaning the child does not object.

When should a child be weaned from the bottle?

With children who are not ill, weaning from the bottle should invariably be begun at the end of the first year, and after a child is thirteen or fourteen months old the bottle should not be given except at the night feeding.

Is there any objection to the child's taking the bottle until it is two or three years old?

There are no advantages and some serious objections. Older children often become so attached to the bottle that only with the greatest difficulty can they be made to give it up. Frequently they will refuse all solid food, and will take nothing except from the bottle so long as it is given, and when finally, at three or four years, it is taken away, they will not touch milk during the rest of their childhood. The difficulty is here that children form the "bottle habit." This habit is troublesome, unnecessary, and should by all means be prevented. An

exclusive diet of milk for children of two or three years often results in anæmia and malnutrition.

How should one train a child to do without the bottle?

This is usually easy if it is begun at one year. The milk should be poured into a tiny glass or cup and little by little the child is taught to drink; at first only a small portion of the food is taken in this way, the balance being given from the bottle; but in the course of a few weeks the average infant learns to drink from a cup without difficulty, and all the food can be so given.

If the child is two or more years old, the only effective means of weaning from the bottle is through hunger. The bottle should be taken away at once and entirely, and nothing allowed except milk from a cup until the child takes this willingly. Sometimes a child will go an entire day without food, occasionally as long as two days, but one should not be alarmed on this account and yield. This is a matter of the child's will and not of his digestion, and when once he has been conquered it is seldom that any further trouble is experienced. As soon as a child has learned to drink his milk from a cup, cereals and other solid foods may gradually be added to the diet. The educational value of such training is not the least important consideration.

Can a baby just weaned take cow's milk of the same proportions as one of the same age who has had cow's milk from birth?

Very rarely; to give a baby who has had nothing but the breast from birth, plain cow's milk, or even that milk which a bottle-fed baby of the same age might take, is almost certain to cause indigestion. The change in the food is quite a marked one, and should be made gradually by beginning with a very weak milk and increasing its strength as the baby becomes accustomed to take cow's milk.

What would be the proper proportions for an infant weaned at four or five months?

About the same as for a healthy bottle-fed infant of two months; the quantity of course should be larger. The food can in most cases be gradually increased so that in two or three weeks the usual strength for the age can be taken.

What would be the proper proportions for an infant weaned at nine or ten months?

About the same as for a bottle-fed infant at four or five months, to be increased as indicated above.

Will not a child lose in weight when placed upon so low a diet?

Very often it will do so for the first week or two, but after that will gain quite regularly; the acute

indigestion, however, which generally accompanies the use of stronger milk will, in most cases, cause a greater loss.

ARTIFICIAL FEEDING

What foods contain all the elements present in mother's milk?

The milk of other animals,—cow's milk being the only one which is available for general use.

Is it not possible for infants to thrive upon other foods than those containing fresh milk?

They may do so for a time, but never permanently. The long-continued use of other foods as the sole diet is attended with great risk.

What are the dangers of such foods?

Frequently scurvy is produced, often rickets, and in other cases simply a condition of general malnutrition,—the child does not thrive, is pale, and its muscles are soft and flabby.

THE SELECTION AND CARE OF MILK USED FOR INFANT FEEDING

What are the essential points in milk selected for the feeding of infants?

That it comes from healthy cows, and that it is clean and fresh.

Is it not important to select a rich milk?

By no means; in fact the very rich milk of highly bred Jerseys and Alderneys has not been found nearly so satisfactory in infant feeding as that from some other herds, such, for example, as the common "grade cows."

Which is the better, milk from one cow or the mixed milk of several cows?

The mixed, or "herd milk," is usually to be preferred, since it varies little from day to day; while that from a single cow may vary considerably.

How fresh is it important that cow's milk should be for the best results in infant feeding?

This depends very much upon the season, and how carefully milk is handled. As ordinarily handled at the dairy and in the home, milk should not be used for infants in winter after it is forty-eight hours old; in summer not after it is twenty-four hours old, and it may be unsafe in a much shorter time. When handled with especial care milk may be safe for a longer time.

What are the two essentials in handling milk?

1. That it be kept clean and free from contamination. This necessitates that cows, stables, and milkers be clean, and that transportation be in sealed

bottles; also that those who handle the milk are themselves healthy and do not come in contact with any contagious disease. All milk-pails, bottles, cans, and other utensils with which the milk comes in contact should be sterilized shortly before they are used, by steam or boiling water.

2. That it be cooled immediately after leaving the cows, and kept at as low a temperature as possible; to be efficient this should not be above 50° F.

Milk produced under hygienic conditions and handled with special care is sold in bottles in most cities under the name of "certified," or "guaranteed," milk. When available such milk should be used for infants. Of course the extra care bestowed in its production and transportation increases the cost of the milk, but the best will usually be found in the end to be the cheapest.

How should milk be handled in the home when obtained fresh from the cows?

That to be used for infants should be strained through a thick layer of absorbent cotton or several thicknesses of cheese-cloth into quart glass jars or milk bottles which should be covered and cooled immediately, best by placing the bottles quite up to their necks in ice water or cold spring water, where they should stand for at least half an hour. That required for children who take plain milk may now

be poured into half-pint bottles, stopped with cotton, and put in the ice-chest, or the coolest place possible. This first rapid cooling is very important and adds much to the keeping qualities of the milk. Milk loses its heat very quickly when cooled in water, but very slowly when it is simply placed in a cold room. After standing four or five hours the top-milk may be removed; after twelve to sixteen hours the cream may be removed.

How should milk be handled when bottled milk is purchased?

It should be cooled as just described, as its temperature is usually somewhat raised during transportation. If it has been bottled at a dairy, the cream or the top-milk may be removed after an hour or two.

How should milk and cream be handled when they are purchased in bulk?

Such milk should never be used for infants when it is possible to obtain bottled milk, as it is much more liable to contamination. Both cream and milk should be poured at once into covered jars and kept in the coolest place possible. The cream and top-milk will seldom rise upon such milk with any satisfactory regularity.

What are the important things to be secured in nursery refrigerators?

Absolute cleanliness is essential; hence the inner portion should be of tile, glass or metal. Those made entirely of metal are often unsatisfactory as in them the ice melts very quickly. If the ordinary metal refrigerator sold is encased in a wooden box, we have the best form. Another easy way of securing the same result is to make for the refrigerator a covering or "cosey" of felt or heavy quilting, which can be easily removed when wet or soiled.

The compartments of the refrigerator should be so arranged that the bottles of milk are either in contact with the ice or very near it. The supply of ice should be abundant. Often the amount of ice is so small, and the bottles so far away, that the temperature of the milk is never below 60° or 65° F. To be really effective a refrigerator should have a temperature where the milk is placed of not over 50° F. The temperature should be tested with the nursery thermometer from time to time to ascertain what results are being obtained. Spoiled milk owing to a faulty refrigerator is to be blamed for many attacks of acute illness among infants. Next to the feeding-bottles it is the one thing in the nursery which should receive the closest attention.

Are there any objections to the use of vacuum (or thermos) bottles for keeping the milk warm or cold?

They are often useful to keep milk cold while traveling. They should not be used to keep milk warm as for night feedings. Milk which has been kept for several hours at the feeding temperature is often so changed as to make the baby ill.

THE MODIFICATION OF COW'S MILK

What is meant by the modification of cow's milk?

Changing its proportions so that it can be more easily digested.

Is it possible to modify cow's milk so as to make it a perfect substitute for mother's milk?

It is not. Although we can modify cow's milk so that the great majority of infants can digest it and thrive on it, it must be remembered that there are differences which cannot be wholly overcome. There are certain peculiar qualities in mother's milk which cow's milk does not contain.

How is this milk, whose proportions have been changed, distinguished from the unchanged milk?

The changed milk is usually called "modified

milk"; the original unchanged milk is known as "plain milk," "whole milk," "straight milk," or is referred to simply as "milk."

What are the principal differences between cow's milk and mother's milk?

Cow's milk has only a little more than half as much sugar; it has nearly three times as much proteids and salts; its proteids and fat are different and more difficult of digestion; its reaction is decidedly acid, that of mother's milk is faintly acid or neutral.

Are there any other important things to be considered?

Yes; mother's milk is always fed fresh and is practically sterile. Cow's milk is generally kept twenty-four hours and sometimes much longer. It is always to a greater or less degree contaminated by dirt and germs, the number of which increases rapidly (1) with the age of the milk; (2) in proportion to the amount of dust or dirt which enters it; (3) with any increase in the temperature at which the milk is kept.

It is just as important for success in infant feeding that these conditions receive attention as that the proportions of the different elements of the milk are right.

How is the acidity of cow's milk overcome?

Usually by the addition of lime-water; one ounce to twenty ounces of food is generally required.

If there is a tendency to constipation the milk of magnesia (Phillips's) may be used; from one half to one teaspoonful being added to each twenty ounces of food.

How is the sugar best increased?

By adding milk sugar to the food; one ounce by measure to each twenty ounces of food will give the proper quantity for the first three or four months. This will make the proportion about the same as in mother's milk.

How should the sugar be prepared?

Simply dissolved in boiled water; if the solution is not clear, or if there is a deposit after standing, it should be filtered by pouring through a layer of absorbent cotton, half an inch thick, which is placed in an ordinary funnel.

Will not cane (granulated) sugar answer as well?

Not as a rule; however, there are many infants who get on very well when cane sugar is used. It has the advantage of being much cheaper. A good grade of milk sugar is somewhat expensive, costing from twenty-five to sixty cents a pound, and cheap samples are apt to contain impurities. Moreover,

there are some infants in whom diarrhœa is excited if the usual amount of milk sugar is given, yet who bear cane sugar very well.

If cane sugar is used, what amount should be added?

Rather less than of milk sugar; usually from one half to three fourths of an ounce, by measure, to each twenty ounces of food is as much as is desirable for most infants.

May any other sugar be used?

Maltose[1] (malt sugar) has the advantage of being very easily digested and when part of the sugar given is maltose, many children gain more rapidly in weight than when only milk sugar or cane sugar is used.

Has maltose any other advantages?

It is somewhat more laxative than other sugars; it is therefore useful when there is constipation.

[1] Dry preparations of maltose available are "dextri-maltose" (Mead Johnson & Co., Jersey City), and "*nahrzucker*" (Soxhlet, Germany). Liquid preparations are Loeflund's or Borcherdt's "malt soup extract"; somewhat less expensive but reliable is the "neutral maltose" (Maltzyme Co., Brooklyn).

For an infant six months old from two teaspoonfuls to two tablespoonfuls of any of these preparations may be added to the food for the day, replacing a similar quantity of milk sugar.

Mellin's food and malted milk also contain a large percentage of maltose.

Are there any disadvantages attending the use of maltose?

It is not well borne if the bowels are loose, nor should it be used for children who vomit frequently or habitually.

Is not the purpose of the sugar to sweeten the food in order to make it palatable?

Not at all; although it does that, its real use is to furnish one of the essential elements needed for the growth of the body, and the one that is required by young infants in the largest quantity.

How do we know that this is so?

By the fact that in good breast milk the amount of sugar is greater than that of the fat, proteids, and salts combined.

We have seen that cow's milk has nearly three times as much proteids (curd) and salts as mother's milk. How are these to be diminished?

By diluting the milk.

Will it be sufficient to dilute the milk twice (i. e., add two parts of water to one part of milk)?

Not for a very young infant. Although this will give about the quantity of proteids present in mother's milk, it is better for most infants in the beginning to dilute the milk at least three times.

If cow's milk is properly diluted and lime-water and sugar added does it then resemble mother's milk?

No; the mixture contains less fat.

Is it desirable to increase the fat to the proportion present in mother's milk?

On account of the difference in digestibility it is usually impossible to give to young infants as much fat in cow's milk as is present in good mother's milk. For most infants it is, however, desirable to give more fat than is contained in cow's milk when this has been simply diluted.

What is the easiest way to secure a milk which contains the proper proportion of fat?

By increasing the fat in the milk before dilution. It may be done by using top-milk or a mixture of milk and cream.

What is top-milk?

It is the upper layer of milk removed after standing a certain number of hours in a milk bottle, glass jar, or any tall vessel with straight sides. It contains most of the cream and some of the milk just below.

The strength of the top-milk is measured by the fat it contains—e. g., 7-per-cent milk contains 7 per

cent fat, etc. This is the top-milk of most use in infant feeding.

When and how should top-milk be removed?

If milk fresh from the cow, or before the cream has risen, is put into bottles and rapidly cooled, the top-milk may be removed in as short a time as four hours. In the case of bottled milk it makes little difference if it stands a longer time, even until the next day. The best means of removing it is by a small cream-dipper[1] holding one ounce; although it may be taken off by a spoon or siphon. It should not be poured off.

Does the upper half always contain 7-per-cent fat?

No; this varies with the length of time the milk has stood, and still more with the richness of the milk used.

The richness of the milk depends on several factors: whether it is from a herd or a single cow, also on the breed of the cow and on the manner of feeding. In good average milk the cream forms about one-sixth of the whole amount after the milk has stood four or five hours.

[1] Obtained from any of the Walker-Gordon milk laboratories, from James Dougherty, No. 411 West 59th Street, New York, and from many druggists. Price, 20 cents.

How can we obtain 7-per-cent top-milk with the different kinds of cow's milk?

From a rather poor milk, by removing the upper eleven ounces from a quart, or about one third.

From a good average milk, by removing the upper sixteen ounces, or one half.

From a rich Jersey milk, by removing the upper twenty-two ounces, or about two thirds.

What is cream?

Cream is often spoken of as if it were the fat in milk. It is really the part of the milk which contains most of the fat. It differs from milk chiefly in containing much more fat.

In what ways is cream now obtained?

(1) By skimming, after the milk has stood usually for twenty-four hours; this is known as "gravity cream." (2) By an apparatus called a separator; this is known as "centrifugal cream"; most of the cream now sold in cities is of this kind. The richness of any cream is indicated by the amount of fat it contains.

The usual gravity cream sold has from 16 to 20 per cent fat. The cream removed from the upper part (one fifth) of a bottle of milk has about 16 per cent fat. The usual centrifugal cream has 18 to 20

per cent fat. The heavy centrifugal cream has 35 to 40 per cent fat.

Is cream more digestible than milk?

This depends much upon circumstances. For most infants it is much less so; many serious disturbances of digestion are caused by cream.

FOOD FOR HEALTHY INFANTS [1]

What are the important points to be remembered in modifying cow's milk for feeding during the early months?

That the proportions of the different elements,—fat, sugar and proteids—should be those best suited to the child's digestion and the needs of the body for growth.

When given in proper amount, difficulty is not likely to be found by healthy infants with the digestion of any of the elements of milk; but when given in excess or when digestion is deranged, any of them may cause trouble.

[1] The directions and formulas given in the following pages are intended only for guidance in feeding children who are not suffering from any special disturbance of digestion; directions for such conditions are given in a later chapter.

What relation should the fat bear to the proteids during this period?

For most infants with good digestion the best results are obtained when the fat is higher than the proteids—e. g., twice as much. However, this is not true of all. There are many healthy infants who are unable to digest this proportion of fat, and who do much better when the fat and the proteids are about equal.

Two groups of formulas are therefore useful: (1) Those in which the fats are higher than the proteids, derived from top-milk; (2) those in which the two are about the same, derived from whole milk.

How can one obtain formulas in which the fat is twice the proteids?

By using for dilution a 7-per-cent milk, for in this the fat is exactly twice the proteids.

How can one get the 7-per-cent milk?

(1) Most easily as top-milk, as described on page 69; or (2) by mixing three parts of milk and one part of ordinary (16-per-cent) cream; (3) from any of the milk laboratories it may be obtained directly.

How should the food be prepared?

It is convenient in calculation to make up twenty ounces of food at a time. The first step is to obtain

the 7-per-cent milk. Then to take the number of ounces of this that are called for in the formula desired.

NOTE.—One should not make the mistake of taking from the top of the bottle only the number of ounces needed in the formula, as this may give quite a different result.

There will be required in addition one ounce of milk sugar[1] and one ounce of lime-water in each twenty ounces. The rest of the food will be made up of boiled water.

These formulas written out would be as follows:

FORMULAS FROM 7-PER-CENT MILK

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
7-per-cent milk ..	2	3	4	5	6	7	8	9	10
Milk sugar.....	1	1	1	1	1	¾	¾	¾	¾
Lime-water.....	1	1	1	1	1	1	1	1	1
Boiled water	17	16	15	14	13	12	11	10	9
	20	20	20	20	20	20	20	20	20

The approximate composition of these formulas expressed in percentages is as follows:

[1] If the milk sugar be measured in the milk-dipper, two scant dipperfuls may be calculated as one ounce. If measured in a tablespoon, three even tablespoonfuls may be calculated as one ounce.

Formula.	Fat.	Sugar.	Proteids.
I	0.70	5.00	0.35
II	1.00	6.00	0.50
III	1.40	6.00	0.70
IV	1.75	6.00	0.87
V	2.00	6.00	1.00
VI	2.40	6.00	1.20
VII	2.80	6.00	1.40
VIII	3.10	6.00	1.55
IX	3.50	6.00	1.75

Why is it necessary to make the food so weak at first?

Because the infant's stomach is intended to digest breast milk, not cow's milk; but if we begin with a very weak cow's milk the stomach can be gradually trained to digest it. If we began with a strong milk the digestion might be seriously upset.

How rapidly can the food be increased in strength from Formula I to II, from II to III, etc.?

No absolute rule can be given. Usually we begin with No. I on the second day; No. II on the fourth day; No. III at seven to ten days; but after that make the increase more slowly. A large infant with a strong digestion will bear a rather rapid increase and may be able to take No. V by the time it is three or four weeks old. A child with a feeble digestion must go much slower and may not reach No. V before it is three or four months old.

It is important with all children that the increase in the food be made very gradually. It may be best with many infants to increase the milk by only half an ounce in twenty ounces of food, instead of one ounce at a time as indicated in the tables. Thus from 3 ounces, the increase would be to 3½ ounces; from 4 ounces to 4½ ounces, etc. At least two or three days should be allowed between each increase in the strength of the food.

The quantities proper for the different ages, and the intervals of feeding, are given on page 109.

What general rule can be given for increasing the food?

To increase when the infant is not satisfied but is digesting well, and always to wait at least two or three days between each addition to the food.

For fuller directions about increasing the food see pages 82 and 83.

How does an infant show that he is not satisfied?

He drains the bottle eagerly and cries when it is taken away. He often forms the habit of sucking his fingers immediately after. He begins to fret

half an hour or an hour before the next feeding is due.

Under such circumstances is it better to increase the strength or the quantity of the food?

It is well to alternate; at first increasing the strength, next the quantity, then the strength, and so on.

Up to what age should formulas from 7-per-cent milk be continued?

Usually up to six or seven months.

What formulas should follow these?

The change should gradually be made to those from whole milk.

How may this be done?

Instead of removing the upper 16 ounces as top milk, one may for two weeks remove the upper 18 ounces as top milk. For the next two weeks remove the upper 20 ounces as top milk. For the next two weeks remove the upper 24 ounces as top milk.

After this the bottle may be shaken up and the whole milk used.

After these changes should the number of ounces of milk in the food remain the same?

Only while the upper 18 ounces are used. When

the upper 20 ounces are removed as top-milk, each 20 ounces of the food should contain 11 ounces of this milk. When the upper 24 ounces are removed, each 20 ounces of the food should contain 12 ounces of this milk. When the whole milk is used, each 20 ounces of the food should contain 13 ounces of the milk.

These formulas written out in full would be as follows:

	I.	II.	III.
	Oz.	Oz.	Oz.
Top-milk.....	Upper 20 oz. 11	Upper 24 oz. 12	Whole milk. .13
Milk sugar....	½	½	½
Lime-water...	1	1	1
Gruel.....	0	4	6
Water.....	8	3	0
	20	20	20

Usually by the time No. II is reached farinaceous food may be introduced in the form of gruel, as explained on page 86.

How long may No. III be continued?

If conditions have been such that the schedule could be followed this formula would be reached at seven or eight months.

With little or no change this may be continued until the child is nearly a year old, the amount of food given at each feeding being, of course, gradually increased. See page 109.

In the series of formulas given in the table the quantities are mentioned for making only twenty ounces of food. How should it be prepared when more than this quantity is needed?

It is equally convenient to make up 25 ounces, 30 ounces, 35 ounces, or 40 ounces at a time.

To make

25	ounces	of	any	formula	add	one quarter	more	of each ingredient
30	"	"	"	"		one half	"	" "
35	"	"	"	"		three quarters	"	" "
40	"	"	"	"		as much	"	" "

Thus, 25 ounces of Formula I would be obtained by using $2\frac{1}{2}$ ounces of milk, $1\frac{1}{4}$ ounces of sugar and lime-water, $21\frac{1}{4}$ ounces of water; 30 ounces of the same would require 3 ounces of milk, $1\frac{1}{2}$ ounces of lime-water and sugar, and $25\frac{1}{2}$ ounces of water; 35 ounces would require $3\frac{1}{2}$ ounces of milk, $1\frac{3}{4}$ ounces of lime-water and sugar, and $29\frac{3}{4}$ ounces of water. The amount of water need not be calculated in any case, but after measuring carefully the other ingredients enough water should be added to bring the total up to the amount required.

FORMULAS FROM WHOLE MILK

Why is such a series of formulas necessary for young infants?

Not all children can take as high fats as are given in formulas derived from 7-per-cent milk.

How is this shown?

Sometimes simply by the fact that they lose appetite or do not thrive properly. Sometimes by marked symptoms of indigestion, most frequently habitual vomiting, occasionally by constipation with dry crumbly stools. In general the advice may be given that if a child is not doing well upon the first series of formulas a change to the second should be made.

Are there any disadvantages in using this group of formulas?

It is certainly true that there is with most children a greater tendency to constipation than when the formulas from top-milk can be given. It is also true that when the fat is made low the gain in weight is less. Because of this fact other things must be introduced to take the place of the fat.

What elements can take the place of the fat?

Principally the carbohydrates—sugar and starch.

More sugar should be given and starches should be introduced earlier than when higher fats are used.

Formulas from Whole Milk (4-per-cent Fat)

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
Milk	4	5	6	7	8	9	10	11	12	13
Sugar	1	1	1	1	1	¾	¾	¾	½	½
Lime-water	1	1	1	1	1	1	1	1	1	1
Water	15	14	11	8	5	4	3	2	1	0
Gruel	0	0	2	4	6	6	6	6	6	6
	20	20	20	20	20	20	20	20	20	20

The approximate composition of these formulas expressed in percentages is as follows:

Formula.	Fat.	Sugar.	Proteids.
I	0.80	6.00	0.70
II	1.00	6.00	0.90
III	1.20	6.00	1.00
IV	1.40	6.50	1.20
V	1.60	6.50	1.40
VI	1.80	6.00	1.60
VII	2.00	6.00	1.80
VIII	2.20	6.00	2.00
IX	2.40	6.00	2.10
X	2.60	6.00	2.30

Gruel for Formulas III, IV, and V should be made, one level tablespoonful of wheat, barley or oat flour to 8 ounces of water.

For Formulas VI, VII, VIII, IX, and X, two level tablespoonfuls to 8 ounces of water should be used.

It will be noted that No. X of this series is the same as No. III, page 76.

How should the food be made up if these formulas are used?

The gruel is cooked separately as described on page 153; when it has partly cooled the milk, lime-water, milk sugar and water are added and thoroughly mixed.

How should the strength of the food be increased when this series of formulas is used?

The general rules given on pages 74 and 75 may be followed, except that on account of the higher proteids in this series the increase after No. III should be made more slowly; so that ordinarily No. V would not be reached until about two months.

How rapidly after this time should the food be strengthened?

In general the advance from one formula to the next stronger should be made once a month. It is often desirable to make half the increase in the middle of the month.

If the schedule is followed No. X would be

reached at seven or eight months and may be continued for the balance of the first year.

GENERAL RULES FOR GUIDANCE IN THE USE OF THE FORMULAS GIVEN

It should again be emphasized that these formulas are not intended for sick children nor for those suffering from any marked symptoms of indigestion. For such infants special rules are given later.

What should be the guide in deciding upon a formula with which to begin for a child who is to be artificially fed?

The age and the weight are of some importance, but the best guide is the condition of the child's digestive organs. One should always begin with a weak formula, particularly, (1) with an infant previously breast fed; (2) with one just weaned, as a child who has never had cow's milk must at first have weaker proportions than the age and the weight would seem to indicate; (3) with infants whose power of digestion is unknown. If the first formula tried is weaker than the child can digest, the food can be strengthened every three or four days until the child's capacity is reached. On the contrary,

if the food is made too strong at first, an attack of indigestion will probably follow.

How should the food be increased in strength?

The first essential is that it be done very gradually; abruptly increasing the food usually causes a disturbance of digestion.

It is never wise to advance more rapidly in strengthening the food than from one formula to the next one in any of the series given; with many infants it is better to make the steps of increase only half as great as those indicated (page 72).

How rapidly should the food be increased in quantity?

The increase should not be more than a quarter of an ounce in each feeding; never oftener than every three days and usually not oftener than once a week.

When should the food be increased?

In the early weeks an increase may be necessary every few days; in the later months sometimes the same formula may be continued for two or three months. It is, however, impossible to give a definite rule as to time. One cannot say with any child that an increase is to be made every week or every two weeks. A much better guide is the condition of the digestion as shown by the child's appetite, the char-

acter of the stools, the sleep, and the general disposition.

The signs indicating that the food should be increased are, that the infant is not satisfied, not gaining in weight, but is digesting well, i. e., not vomiting, and having good stools. One should not increase the food, however, so long as the child seems perfectly satisfied and is gaining from four to six ounces a week, even though both the quantity and the strength of the food are considerably below the average; nor should the food be increased if the child is gaining from eight to ten ounces a week, even if he seems somewhat hungry. The appetite is not always a safe guide to follow. There are many infants who will habitually take more food than they are able to digest and there is a danger of increasing the amount of food beyond the normal capacity of the child's stomach. The ultimate results of such overfeeding are serious disturbances of digestion and in some instances dilatation of the stomach.

How can one know whether the strength or the quantity of the food should be increased?

In the early weeks it is well first to increase the strength of the food, the next time to increase the quantity, then the strength again, etc. After the fourth or fifth month, the quantity, chiefly, should be increased.

If a slight disturbance or discomfort occurs after the food has been strengthened, is it best to go back to the weaker formula or to persist with the new one?

Symptoms of minor discomfort are seen for a day or two with many infants after an ordinary increase in food; but in most cases an infant soon becomes accustomed to the stronger food and is able to digest it. If, however, the symptoms of disturbance are marked, one should promptly go back to the weaker formula. The next increase should be a smaller one.

Should one be disturbed if for the first two or three weeks of artificial feeding the gain in weight is very slight or even if there is none?

Not as a rule. If the infant does not lose weight, is perfectly comfortable, sleeps most of the time, and does not suffer from any symptoms of indigestion, such as colic, vomiting, etc., one may be sure that all is going well and that the infant is becoming used to his new food. As the child's appetite improves and his digestion is stronger, the food may be increased every few days and very soon the gain in weight will come and will then be continuous. If, however, the scales are watched too closely and, because there is only a slight gain in weight or none at all, the food is rapidly increased, an acute disturbance of digestion is pretty certain to follow.

Is not constipation likely to occur if the child is on a very weak food?

It is very often seen and is due simply to the small amount of residue in the intestine. But if the bowels move once a day, one should not be disturbed even when the movements are small and somewhat dry. As the food is gradually strengthened, this constipation soon passes off; while if injections, suppositories, or cathartics are used to produce freer movements, the functions of the bowels are likely to be disturbed.

Under what circumstances should the food be reduced?

Whenever the child becomes ill from any cause whatever, or whenever any marked symptoms of indigestion arise.

How may this be done?

If the disturbance is only a moderate one and the food has been made up for the day, one third may be poured off from the top of each bottle just before it is given, and this quantity of food replaced by the same amount of boiled water.

If the disturbance is more severe, the food should be immediately diluted by at least one half and at the same time the quantity given should be reduced.

For a severe acute attack of indigestion the regu-

lar food should be omitted altogether and only water given until the doctor has been called.

If the food has been reduced for a disturbance of digestion, how should one return to the original formula?

While the reduction of the food should be immediate and considerable, the increase should be very gradual. After a serious attack of acute indigestion, when beginning with milk again, it should not be made more than one fifth the original strength, and from ten days to two weeks should pass before the child is brought back to his original food, which should be done very gradually. It is surprising how long a time is required with young infants before they completely recover from an attack of acute indigestion, even though it did not seem to be very severe. The second disturbance always comes from a slighter cause than the first one.

THE ADDITION OF OTHER FOODS TO MILK

When should other food be added to the milk?

This depends upon circumstances. If formulas from 7-per-cent milk are given, farinaceous food is usually begun at six or seven months. If formulas from whole milk are used it may be given earlier; a

small amount may be added as early as two months, and at three months more may be given. The reason for this has already been mentioned (page 79).

What further additions may be made to the diet of healthy infants during the first year?

Beef juice, the white of egg, and orange juice.

How and when may beef juice be used?

With infants who are strong and thriving satisfactorily it may be begun at ten or eleven months; two teaspoonfuls may be given daily, diluted with the same quantity of water, fifteen minutes before the midday feeding; in two weeks the quantity may be doubled; and in four weeks six teaspoonfuls may be given. The maximum quantity at one year should not be more than two or three tablespoonfuls.

With delicate infants who are pale and anæmic, beef juice is more important, and it may often be wisely begun at five or six months in half the quantities mentioned.

When should white of egg be used?

Under the same conditions as beef juice, particularly with infants who have difficulty in digesting the proteids (curd) of milk. At six months half the white of one egg may be given at one time, and soon after this the entire white of one egg. The best

manner of cooking is the "coddled" egg (see page 155).

When should orange juice be begun?

There are many infants whose nutrition is distinctly benefited by giving small quantities of orange juice as early as five or six months, when two or three teaspoonfuls a day may be given an hour before the feeding. By the time one year is reached from two to four tablespoonfuls a day may be given. It is particularly useful when there is constipation. It should always be strained, and care should be taken that it is sweet and fresh.

SUBSTITUTES FOR FRESH MILK

When no fresh cow's milk can be obtained, what substitutes are most reliable?

Condensed milk; sterilized milk in bottles; dried milk; goat's milk. Of the condensed milks available in the United States, Borden's Eagle brand is probably the most reliable. The Bear brand of Swiss condensed milk is perhaps as trustworthy as any obtained in Europe.

Dried milk is derived from fresh milk by rapid evaporation of the water. With the addition of milk sugar it is sold as a food for infants under the name of *mammala.* It requires only

to be dissolved in water for feeding. Sterilized milk sold in bottles is widely used in Europe but not much in this country. On the whole it is not so convenient and I think less reliable than condensed milk.

All of these substitutes are open to the same objections, and though convenient for travelling and often necessary for use in foreign countries, they are not to be advised as permanent infant foods where fresh cow's milk can be obtained; they are, however, to be preferred to the proprietary infant foods.

Goat's milk may be had in many foreign countries, and when fresh and produced in cleanly conditions it is to be preferred to any of the substitutes mentioned above as a permanent food. For most infants it requires the same modification as cow's milk.

OVERFEEDING

What is meant by overfeeding?

Giving an infant too much food; either too much at one time or too frequently. Overfeeding is sometimes practised during the day, but is chiefly done at night.

Is not an infant's natural desire for food a proper guide as to the quantity given?

The appetite of a perfectly normal infant usu-

ally is; but overeating is a habit gradually acquired and may continue until twice as much food as is proper is taken in the twenty-four hours. This habit is most frequently seen in infants whose digestion is not quite normal; because of the temporary relief from discomfort experienced by taking food into the stomach, they often appear to be hungry the greater part of the time, especially at night.

What are the causes of overfeeding?

The most common one is the habit of watching the weight too closely, and the conviction on the part of the mother or nurse that, because a child is not so large nor gaining so rapidly as some other infant of the same age, more food or stronger food should be given.

What harm results from overfeeding?

All food taken in excess of what a child can digest becomes a burden to him. The food lies in the stomach or bowels undigested, ferments, and causes wind and colic. When overfeeding is longer continued, serious disturbances of digestion are soon produced. The infant is restless, fretful, constantly uncomfortable, sleeps badly, and stops gaining and may even lose in weight. Such symptoms may lead to the mistaken conclusion that too little food is given, and it is accordingly increased, when it should

be diminished. One of the results of long-continued overfeeding is dilatation or stretching of the stomach.

What should guide one as to the quantity of food to be given to any infant?

(1) The size of the infant's stomach at the different months; (2) the amount of milk which the healthy nursing infant gets; (3) the quantities with which most children do best. The table of quantities and intervals of feeding, on page 109, gives the average figures derived from these sources. It is seldom wise to go beyond the limits there stated; nor should one insist upon giving any fixed amount if it is clearly more than the child wants or can be made to take except by continued coaxing.

LOSS OF APPETITE

What is to be done when without any other signs of illness a child's appetite gradually fails?

This is often the result of a long period of overfeeding or the use of milk too rich in fat. If in all other respects the child seems well and simply does not want his food, it should be offered at regular hours, but not more frequently; on no account should he be coaxed, much less forced, to eat, even though he

takes only one half or one third the usual quantity. The intervals between feedings should not be shortened but rather lengthened. Often, with a child a year old, it is necessary to reduce the number of feedings to four or even three in twenty-four hours. Water, however, may be offered at more frequent intervals. The food should be weakened rather than strengthened. No greater mistake can be made than, because so little is taken, coaxing or forcing food at short intervals through fear lest the child may lose weight.

THE CHANGES IN THE FOOD REQUIRED BY SPECIAL SYMPTOMS OR CONDITIONS

Why is it that an infant so often vomits some of its food within a few moments after finishing its bottle?

Usually because the quantity is too large. Sometimes it is due to the fact that the food is taken too rapidly, from too large a hole in the nipple. It may be due to too tight clothing, or to moving the child about in such a way as to press upon the stomach.

What are the principal causes of, and the changes in the food required by habitual vomiting, regurgi-

tation, or spitting up of small quantities of food between feedings, often repeated many times a day?

This is a symptom of gastric indigestion, and a most troublesome one. In such conditions formulas from top milk should not be used, but rather those from whole milk. The lime-water should be increased.

In cases not improved by this change it may be necessary to reduce the fat still further. This is especially true if the whole milk used is very rich. Under these circumstances one should remove some of the cream from the top of the bottle before shaking it up.

How much cream should be removed?

At first 4 ounces may be taken off, after which the bottle is shaken and the balance used as in the formulas from whole milk. After a few days if the symptoms improve only 3 ounces of cream may be removed. After a few days longer only 2 ounces are removed, then only 1 ounce and finally the child is brought back to the mixtures from whole milk.

How much lime-water may be used?

Improvement from this change may follow if the amount of lime-water is doubled. There is rarely any advantage in using more than this;—i. e., 2 ounces in 20 ounces of food.

Is vomiting often increased by the sugar?

This is not likely with milk sugar if only the quantity mentioned in the formulas is used. However the use of cane sugar often aggravates the vomiting, and maltose almost invariably does so. Therefore under these conditions the use of any of the malted foods should be carefully avoided.

What changes should be made in the intervals of feeding?

Under no circumstances should a vomiting baby be fed oftener than every three hours, and sometimes the intervals should be longer.

What changes should be made in the quantity given at a feeding?

It is difficult to lay down an absolute rule. Usually a small quantity of a stronger food is better than a large quantity of a weak food. But one should not give more than is advised in the schedule for the age of the child. To give somewhat smaller quantities is sometimes useful but often this is of no assistance.

What are the causes of, and food changes required by a constant and excessive formation of gas in the

stomach, leading to distention and pain, or eructations (belching) of gas and often of a sour, watery fluid?

This is often associated with habitual vomiting, and is due to similar causes, but particularly to the sugars mentioned.

Besides the measures already described to control vomiting, benefit sometimes follows the use of benzoate of soda, of which half a grain may be added to each ounce of food and continued for a few weeks if necessary.

What changes should be made in the food when there is habitual flatulence and colic?

Flatulence occurs when there is excessive formation of gas in the intestines. If this is readily expelled the child suffers no great discomfort; but if not, some distention of the bowel takes place and colic results.

Both these conditions are greatly aggravated by constipation, and to relieve the constipation is often the best means of controlling them.

The gas usually arises from faulty digestion of the sugars or starch, and any of these elements of the food may need to be reduced, particularly the starch, which in many cases should be omitted altogether.

What changes should be made in the food for chronic constipation?

Nothing should be done if the child has one good movement a day. Such a child cannot be called constipated.

The constipation of the first weeks of life has been already referred to (page 85); it usually disappears as the food is gradually strengthened in all its proportions.

Habitual constipation at a later period is difficult to overcome by diet alone. It sometimes depends upon the fact that the proteids are too high, and sometimes that the fat is too low. Hence it is more frequent when infants are fed upon formulas from whole milk, than when formulas from top-milk, or milk and cream are used. But it is not desirable to use a top-milk containing more than 7-per-cent fat for this purpose as other disturbances of digestion may be produced.

A part or all of the milk sugar may be replaced by maltose (page 65).

The substitution of the milk of magnesia for the lime-water as recommended on page 64 will often be found useful. After a short time the amount given each day may gradually be reduced until finally it is discontinued.

To infants over nine months old, orange juice may be given.

What special modifications are required during very hot weather?

During the warm season it is well to make the proportion of fat less than during cold weather. During short periods of excessive heat it should be much less. The fat is reduced by using whole milk in place of the 7-per-cent milk. At such times also the usual food should be diluted, and water should be given freely between the feedings.

What changes should be made in the food of a child who, with all the signs of good digestion, gains very little or not at all in weight?

If the child seems hungry the quantity of food may be increased; but if the child will not readily take any more in quantity the strength may be increased by the use of the next higher formula. If there is no vomiting the addition of one of the preparations of maltose (page 65) as recommended for the relief of constipation may be useful. One should, however, be extremely careful under these circumstances not to coax or force a child to eat; for this plan is almost certain to cause disturbance of digestion and actual loss in weight. A better policy is that of looking after the other factors in the

child's life,—the care, sleep, fresh air, etc., for with these rather than with the food the trouble often lies.

What should be done with infants who in spite of all variations in the milk continue to have symptoms of indigestion and do not thrive?

Except inmates of institutions who form a class by themselves, most infants who receive proper care thrive upon milk if the proportions suited to the digestion are given. Still there are some who do not. The nutrition of such is always a matter of difficulty.

If a wet-nurse is available the employment of one is the thing most likely to succeed, particularly if the infant is under four or five months old.

If the infant is older, or if a wet-nurse cannot be obtained, some of the substitutes for fresh cow's milk may be tried. One of the best is condensed milk (see page 117). This is more likely to agree if the symptoms are chiefly intestinal (colic, flatulence, curds in the stools, constipation or diarrhœa) than if they are chiefly gastric (vomiting, regurgitation, etc.).

What changes in the food are required by slight indisposition?

For slight general disturbances such as dentition, colds, sore throats, etc., it is usually sufficient simply

to dilute the food. If this is but for two or three feedings, it is most easily done by replacing with boiled water an ounce or two of the food removed from the bottle just before it is given; if for several days, a weaker formula should be used.

What changes should be made for a serious acute illness?

For such attacks as those of pneumonia, bronchitis, measles, etc., attended with fever, the food should be diluted and the fat reduced as described on page 97. It should be given at regular intervals, rather less frequently than in health. Water should be given freely between the feedings. Food should not be forced in the early days of an acute illness, since the loss of appetite usually means an inability to digest much food.

What immediate changes should be made in the food when the child has an acute attack of gastric indigestion with repeated vomiting, fever, pain, etc.?

All milk should be stopped at once, and only boiled water given for ten or twelve hours; afterward barley-water or whey may be tried, but no milk for at least twenty-four hours after the vomiting has ceased. When beginning with modified milk, formulas made from skimmed milk as described

on page 93 should be used for a few days. The proportion of lime-water may be doubled.

What changes should be made for an attack of intestinal indigestion with looseness of the bowels?

If this is not severe (only two or three passages daily), the milk sugar should be omitted, the fat should be lowered in the manner stated just above, and the milk should be boiled for five minutes. If undigested milk appears in the stools, it may be still further diluted. If the diarrhœal attack is more severe, and attended by fever and foul-smelling movements of greater frequency, all milk should be stopped immediately, and the diet mentioned just above under the head of acute disturbances of the stomach should be employed.

What changes in the food should be made when the child seems to have very little appetite and yet is not ill?

The number of feedings should be reduced, the interval being lengthened by one hour or even more. No greater mistake can be made than to offer food every hour or two to an infant who is not hungry. That only prolongs and aggravates the disturbance.

What other conditions besides the food greatly influence the child's digestion?

Proper clothing, warm feet, regular habits, fresh

air, clean bottles, and food given at the proper temperature, are all quite as important as the preparation of the food; quiet, peaceful surroundings and absence of excitement are also essential to good digestion. In many cases in which children suffer frequently from indigestion and do not gain properly in weight, the fault is not with the food but with the care that the child receives. Both while the food is being taken and afterwards he should be left quite alone. This is particularly necessary with nervous children.

COMMON MISTAKES IN MILK MODIFICATION AND INFANT FEEDING

I. In using modifications made from top-milk, much confusion arises from the notion that top-milk is a single definite thing, whereas its composition depends upon a great variety of conditions and, unless all these are known, it is impossible to tell how strong it is. Directions for the removal of top-milk should be explicitly followed, or the results will be very different from those expected.

II. In formulas calling for a certain number of ounces of top-milk, the mistake is made of removing only the number of ounces needed for the formula. The proper way is to remove the amount required to

secure a top-milk of the desired strength and then to take of this the number of ounces needed in the formula.

III. A rich Jersey milk is used as if it were ordinary milk. The formulas given in this book are chiefly calculated on the basis of a good average milk which contains about 4 per cent fat. Many persons have the idea that the richer the milk, the more rapidly the child will gain in weight, and hence the superiority of such milk for infant feeding. While it is true that some children taking a very rich milk may, for a time, gain rapidly in weight, yet sooner or later, serious disturbances of digestion are nearly always produced.

IV. The food is increased too rapidly, particularly after some disturbance of digestion. If, in an infant three or four months old, an attack of somewhat acute indigestion occurs, the food should seldom be given again in full strength before two weeks. The increase in the diet should be made very gradually, the steps being made only one half those indicated in the series of formulas found on page 72. Otherwise it generally happens that the attack of indigestion is very much prolonged and much loss in weight occurs.

V. When symptoms of indigestion occur, the food is not reduced rapidly enough. Indigestion usually

means that the organs are, for the time, unequal to the work imposed. If the food is immediately reduced by one half, the organs of digestion soon regain their power and the disturbance is short. In every case the amount of reduction should depend upon the degree of the disturbance.

PREPARATION OF COW'S MILK AT HOME

What articles are required for the preparation of cow's milk at home?

Feeding-bottles, rubber nipples, an eight-ounce graduated measuring glass, a glass or agate funnel, bottle brush, cotton, alcohol lamp or, better, a Bunsen gas burner, a tall quart cup for warming bottles of milk, a pitcher for mixing the food, a wide-mouth bottle for boric acid and one for bicarbonate of soda, and a pasteurizer. Later, a double boiler for cooking cereals will be needed.

What bottles are to be preferred?

A cylindrical graduated bottle with a rather wide neck, so as to admit of easy washing, and one which contains no angles or corners. A single size holding eight ounces is quite sufficient for use during the first year. All complicated bottles are bad, being difficult to clean. One should have as many bottles in use as the child takes meals a day.

How should bottles be cared for?

As soon as they are emptied they should be rinsed with cold water and allowed to stand filled with water to which a little bicarbonate of soda has been added. Before the milk is put into them they should be thoroughly washed with a bottle brush and hot soapsuds and then placed for twenty minutes in boiling water.

What sort of nipples should be used?

Only simple straight nipples which slip over the neck of the bottle. Those with a rubber or glass tube are too complicated and very difficult to keep clean. Nipples made of black rubber are to be preferred. The hole in the nipple should not be so large that the milk will run in a stream, but just large enough for it to drop rapidly when the bottle with the nipple attached is inverted.

How should nipples be cared for?

New nipples should be boiled for five minutes; but it is unnecessary to repeat this every day as they soon become so soft as to be almost useless. After using, nipples should be carefully rinsed in cold water and kept in a covered glass containing a solution of borax or boric acid. At least once a day they should be turned inside out and thoroughly washed with soap and water.

What sort of cotton should be used?

The refined non-absorbent cotton is rather better for stoppering bottles, but the ordinary absorbent cotton will answer every purpose.

Which is better, the Bunsen burner or the alcohol lamp?

If there is gas in the house, the Bunsen burner is greatly to be preferred, being cheaper, simpler, and much safer than the alcohol lamp. If the lamp is used, it should stand upon a table covered with a plate of zinc or tin, or upon a large tin tray. The French pattern of alcohol lamp is the best.

Give the directions for preparing the food according to any of the above formulas.

The nurse's hands, bottles, tables, and all utensils should be scrupulously clean. First, dissolve the milk sugar in boiled water, filtering if necessary. Then add the milk and cream and lime-water, mixing the whole in a pitcher. A sufficient quantity of food for twenty-four hours is always to be prepared at one time. This is then divided into the number of feedings required for the day, each feeding being put in a separate bottle, and the bottle stoppered with cotton. The bottles should then be cooled rap-

idly by standing, first in tepid then in cold water, and afterward placed in an ice chest. If the milk is to be pasteurized or sterilized, this should precede the cooling.

DIRECTIONS FOR FEEDING INFANTS

How should the bottle be prepared at feeding time?

It should be taken from the ice chest, and warmed by standing in warm water which is deep enough to cover the milk in the bottle; it should then be thoroughly shaken and the nipple adjusted; the nurse should see that the hole in the nipple is not too large nor too small.

How may the temperature of the milk be tested?

Never by putting the nipple in the nurse's mouth. Before adjusting the nipple, a teaspoonful may be poured from the bottle and tasted, or a few drops may be poured through the nipple upon the inner surface of the wrist, where it should feel quite warm but never hot; or a thermometer may be placed in the water in which the bottle stands. A dairy thermometer should be used, and the temperature of the water should be between 98° and 105° F.

What is a simple contrivance for keeping the milk warm during feeding?

A small flannel bag with a draw string may be slipped over the bottle.

In what position should an infant take its bottle?

For the first two or three months it is better, except at night, when it may be undesirable to take the infant from its crib, that it be held on the nurse's arm during the feeding; later it may lie on its side in the crib provided the bottle is held by the nurse until it has been emptied; otherwise a young infant readily falls into the bad habit of alternately sucking and sleeping, and often will be an hour or more over its bottle.

How much time should be allowed for one feeding?

Not more than twenty minutes. The bottle should then be taken away and not given until the next feeding time. Under no circumstances should an infant form the habit of sleeping with the nipple in its mouth. A sleepy infant should be kept awake by gentle shaking until the food is taken, or the bottle should be removed altogether.

Should an infant be played with soon after feeding?

On no account; such a thing frequently causes

vomiting and sometimes indigestion. After every feeding the infant should be allowed to lie quietly in its crib, and disturbed as little as possible, either by the nurse, the parents or visitors.

INTERVALS OF FEEDING

How often should a baby be fed during the first month?

Every two hours during the day and twice during the night, or ten feedings in the twenty-four hours.

At what age may the interval be made two and a half hours?

Usually at four or five weeks.

When may it be increased to three hours?

Usually at two months.

Why should not a child be fed more frequently?

It takes the stomach nearly two hours to digest a meal at two months, and about two and a half hours at five or six months, and if the meals are too near together the second one is given before the first has been digested and vomiting and indigestion result. The meals should be far enough apart to give the stomach a little time for rest just before each feeding.

Schedule for Feeding Healthy Infants during the First Year

Age.	Interval between meals by day.	Night feedings (10 P. M. to 7 A. M.)	No. of feedings in 24 hours.	Quantity for one feeding.	Quantity for 24 hours.
	Hours.			Ounces.	Ounces.
2d to 7th day.....	2	1	10	1 –1½	10–15
2d and 3d weeks....	2	1	10	1½–3	15–30
4th and 5th weeks..	2½	1	8	2½–4	20–32
6th to 9th week.....	2½	1	8	3 –5	24–40
9th week to 5th mo.	3	1	7	4 –6	28–42
5th to 9th month...	3	0	6	5 –7½	30–45
9th to 12th month..	4	0	5	7 –9	35–45

This schedule gives the averages for healthy children. The smaller quantities are those required by small children whose digestion is not very vigorous. The larger quantities are those required by large children with strong digestion; in very few cases will it be advisable to go above these figures.

The interval is reckoned from the beginning of one feeding to the beginning of the next one.

When should the interval between the feedings be lengthened?

When there is gastric indigestion as shown by habitual vomiting or the regurgitation of food long after the bottle is finished; also when the appetite is

very poor so that the infant regularly leaves some of its food.

When should the interval between the feedings be shortened?

This is done much too frequently; it is rarely advisable to feed any infant, except one seriously ill, oftener than the time put down in the schedule.

REGULARITY IN FEEDING

How can a baby be taught to be regular in its habits of eating and sleeping?

By always feeding at regular intervals and putting to sleep at exactly the same time every day and evening.

When should regular training be begun?

During the first week of life.

Should a baby be wakened to be nursed or fed if sleeping quietly?

Yes, for a few days. This will not be required long, for with regular feeding an infant soon wakes regularly for its meal, almost upon the minute.

Should regularity in feeding be kept up at night as well as during the day?

Only up to nine or ten o'clock; after that time a baby should be allowed to sleep as long as it will.

At what age may a well baby go without food from 10 P. M. *to 6 or 7* A. M.*?*

Usually at four months, and always at five or six months. Night feeding is one of the most frequent causes of wakefulness and disturbed sleep.

STERILIZED MILK

What is meant by sterilizing milk?

Heating milk for the purpose of destroying germs.

Does all cows' milk contain germs?

Yes; even when handled most carefully, milk contains many germs; but when carelessly handled, and in summer, the number is enormous. While most of these are harmless or cause only the souring of milk, others are occasionally present which may produce serious diseases such as typhoid fever, diphtheria, scarlet fever, cholera, tuberculosis, and many forms of diarrhœa.

Under what circumstances is it necessary to sterilize milk?

1. In warm weather when it cannot be obtained fresh; hence always in cities and towns during the summer.

2. When one cannot be certain that the cows are healthy, or that the milk has been carefully handled.

3. When the milk is to be kept for any considerable time (i. e., over twenty-four hours), especially if no ice can be had.

4. During epidemics of typhoid fever, scarlet fever, diphtheria, or any form of diarrhœal disease.

What are the two methods of heating milk?

The first is known as *sterilizing,* in which the milk is heated to 212° F. for one hour or one hour and a half; the second is known as *pasteurizing,* in which the milk is heated to 155° or 160° F. for thirty minutes. A temperature of 155° F. continued for thirty minutes is sufficient to kill the germs of the diseases above referred to.

Will milk which has been thus treated keep indefinitely?

No; for although all the living germs may be killed, there are many undeveloped germs, or spores, which are not destroyed, and which soon grow into living germs. Milk heated to 212° F. for an hour will often keep upon ice for two or three weeks; that heated to 155° F. should be used within 24 hours.

Is milk which has been sterilized always a safe food?

No; for the reason that the milk may be so old,

so dirty, and so contaminated before sterilizing that it may be still unfit for food, though it contains no living germs.

Is cow's milk rendered more digestible by being heated in this way?

For most infants sterilizing milk does not improve its digestibility but rather the contrary. Sterilized milk should be modified for infant feeding in the same way as milk which has not been heated.

Is milk in any way injured by heating to 212° F. for an hour?

There is abundant evidence that milk is rendered less digestible by such heating; also that it is more constipating, and that for some children its nutritive properties are injured, so that it may cause scurvy; this, however, is not seen unless it is continued as the sole food for a long period. These objections are of so much importance that this plan of heating milk is not to be recommended for general use.

When is it advantageous to heat milk to 212° F.?

For use upon long journeys, such as crossing the ocean. Milk should then be heated for one hour upon two successive days, without removing the cotton stoppers from the bottles.

Is milk in any way injured by heating at 155° F. for thirty minutes?

This point is not yet definitely settled. Such heating does not affect the taste of milk and does not render it more constipating. The unfavourable effects, if there are any, are so slight that they need not deter one from the use of pasteurized milk, even for long periods. The preference, however, should be given to milk which is so clean and so fresh as not to require any heating.

How should milk be pasteurized?

A convenient form of apparatus is that known as Freeman's pasteurizer[1]; another is the Walker-Gordon pasteurizer.[2]

How should milk be cooled after pasteurizing?

Always by placing the bottles in cold water, so as to cool them rapidly; never by letting them stand at the temperature of the room, or by placing them, when warm, in an ice box.

Why is this precaution necessary?

Cooling in the air or in an ice box requires from two to four hours, and during that time a great many

[1] This can be obtained at 411 West Fifty-ninth Street, New York, with bottles and full directions; a tin one, at a cost of $3.50, and a copper one, which is much more durable, for $7.00.

[2] Obtained at the same prices from any of the Walker-Gordon milk laboratories.

of the undeveloped germs may mature and greatly injure the keeping properties of the milk. In the cold water milk can be cooled in from ten to twenty minutes if the water is frequently changed, or if ice is added to the water.

Is it better to rely upon the pasteurization of milk at home or to purchase that which has been pasteurized before delivery?

The home pasteurization is by all means to be preferred. Unless the pasteurized milk of the dealer is received in sterile bottles, kept at a low temperature and used within twenty-four hours after heating, it may not be safe even though it does not turn sour.

MODIFIED MILK OF THE MILK LABORATORIES

What is "modified milk" of the milk laboratories?

It is milk containing definite proportions of the fat, sugar, proteids, etc., put up usually according to the prescription of a physician, who indicates how much of the different elements he desires. The most reliable are the laboratories of the Walker-Gordon Company, which has branches in most of the large cities of the United States.

This is an excellent method of having milk prepared, since it can be done with greater care and cleanliness than are possible in most homes. It is besides a great convenience if circumstances make it impossible to prepare the milk properly at home.

The laboratory should be used for infant feeding only by one who is somewhat familiar with this method of ordering milk.

PEPTONIZED MILK

What is peptonized milk?

Milk in which the proteids (curd) have been partially digested.

How is this accomplished?

By the action of a peptonizing powder which is composed of a digestive agent known as the extractum pancreatis and bicarbonate of soda, which is added to the plain or diluted milk. This is sold in tubes or in tablets, and it is the active ingredient of the peptogenic milk powder.

Since it is infrequent for the proteids of milk to be the cause of indigestion, peptonizing milk has only a limited use chiefly in cases of acute illness.

CONDENSED MILK

What is condensed milk?

Fresh milk which has been sterilized and then evaporated until one part represents about two and a half parts of the original milk. The canned condensed milk usually has cane sugar added in the proportion of about seven ounces to one pint.

How should condensed milk be used?

For an infant three or four months old with symptoms of indigestion, it should at first be diluted with 16 parts of boiled water, or, sometimes preferably, with barley-water. With improvement in the symptoms the dilution may be 1 to 14, 1 to 12, 1 to 10, and 1 to 8, these changes being gradually made. The intervals between feedings and the quantities for one feeding are given on page 109.

How long should condensed milk be continued?

In most cases it should be used as the sole food for a few weeks only. Afterward, one feeding a day of a weak formula of modified milk (e. g., No. II or III Whole Milk Series, page 79) may be given; later two feedings, and thus gradually the number of modified milk feedings is increased until the child is taking only modified milk.

Condensed milk is not to be recommended as a

permanent food where good fresh cow's milk can be obtained.

What are the objections to its use?

It is very low in fat and proteids, and high in sugar. This accounts for its easy digestibility, and also explains why children reared upon it often gain rapidly in weight, yet have as a rule but little resistance. They are very prone to develop rickets and sometimes scurvy.

BUTTERMILK

What are the advantages of buttermilk in infant feeding?

Chiefly that the fat has been removed, this element being the one with which many children have difficulty; there are, besides, some changes in the sugar and proteids due to the slight fermentation which takes place in the souring of the milk.

When is buttermilk to be employed?

It is useful in many cases of severe chronic indigestion and in some cases of acute indigestion.

How is it prepared and fed?

Fresh buttermilk may be purchased at many dairies; or skimmed milk may be fermented by vari-

ous ferments sold in tablet form, such as "lactone," "bulgara," etc.; or a specially prepared buttermilk may be purchased from one of the milk laboratories known as "lactic acid milk" or elsewhere under a great variety of other names. It may be fed as prepared or diluted with plain water or barley-water. It is not to be continued long as the sole food without the addition of sugar.

CASEIN MILK

What is "casein milk"?

This term has been given to a form of modified milk extensively used in Germany, in which much of the milk sugar has been removed and the casein increased.

When is this useful?

Chiefly in cases of indigestion, acute or chronic, accompanied by diarrhœa with thin, sour stools.

How is casein milk prepared?

One quart of whole milk is coagulated by rennet (see page 152), the whey is then strained off and thrown away. The curd is carefully rubbed through a fine wire sieve with the addition of one pint of buttermilk. Enough water is then added to bring the whole up to one quart.

How is it fed?

For older infants it is given as prepared above; for younger and more delicate ones it is at first diluted with an equal volume of water, afterwards with less water. It is continued for from one to three weeks or until the symptoms improve; then sugar is added, preferably maltose. Later the infant is given formulas from whole milk (page 79).

FEEDING DURING THE SECOND YEAR

If the general directions given in previous pages have been followed, the infant will be taking at eleven or twelve months five meals, at four-hour intervals, 8 or 9 ounces at a time. Of this, about two-thirds should be milk and one-third gruel—i. e., Formula III, page 76, or Formula X, page 79. Besides this he will probably be receiving orange juice, one or two ounces a day, and beef juice, one ounce a day.

How many meals are required in the second year?

Usually five meals. Some children will sleep from 6 P. M. to 6 A. M. without waking, but unless there is a feeding at 10 P. M. children are apt to wake very early in the morning.

Should each feeding be prepared at the time given, or all feedings at one time, as during the first year?

During the second and third years it is better to prepare the milk for the entire day at one time.

Later, when only plain milk is used, the quantities needed for the different feedings should be put into separate bottles, which then may be pasteurized or not as is necessary. In this way the different feedings are kept separate, and the day's supply of milk is not disturbed every time the child is fed, as otherwise is unavoidable. The food should be prepared as soon as possible after the daily milk supply is delivered in the morning.

What changes may now be made in the food?

The proportion of milk in the food may be increased; the lime water and milk sugar may be gradually omitted; broth may be added to one of the feedings. The child should begin to take at least part of his food from the cup.

Give a proper diet for an average healthy child of twelve months.

6.30 A. M. Milk, six to seven ounces; diluted with barley or oat gruel, two to three ounces; after the thirteenth month, taken from a cup.

9 A. M. Orange juice, one to two ounces.

10 A. M. Milk, two parts; oatmeal or barley gruel, one part; from ten to twelve ounces in all may be allowed; it should be given from a cup.

2 P. M. Beef juice, one to two ounces;
or, the white of one egg, slightly cooked; later the entire egg;
or, mutton or chicken broth, four to six ounces.
Milk and gruel in proportions above given, four to six ounces.

6 P. M. Same as at 10 A. M.

10 P. M. Same as at 6.30 A. M., except that the milk may be given from the bottle.

How long may this schedule be followed?

Usually until the fourteenth or fifteenth month. After this time the cereals may be given much thicker and fed from a spoon.

May any other fruit juices be given at this period?

Orange juice is the best; next to this the juice of fresh ripe peaches, red raspberries or strawberries. All these should be strained very carefully through muslin to make sure that the child gets none of the pulp or seeds, either of which may cause serious disturbance. Of the orange or peach juice, from one to four tablespoonfuls may be allowed at one time; of the others about half the quantity. The fruit juice is best given one hour before the second feeding.

When should a child be weaned from its bottle?

Most children can and should be taught to take

their food from the cup or spoon by the time they are thirteen months old; but it is convenient to give the 10 P. M. feeding from the bottle during the greater part of the second year (see page 55).

Give a proper diet for an average child from the fourteenth to the eighteenth month.

The bottle should not be given except at night. Cereals may now form an important part of the diet. They should be very thoroughly cooked, usually for three hours, and strained.

The daily schedule should be about as follows:

6.30 A. M. Milk, warmed, eight to ten ounces, given from a cup.

9 A. M. Fruit juice, one to three ounces.

10 A. M. Cereal: one, later two or three, tablespoonfuls of oatmeal, hominy or wheaten grits, cooked for at least three hours and strained; upon this from one to two ounces of thin cream, or milk and cream, with plenty of salt, but without sugar.

Crisp dry toast, one piece;
or, unsweetened zwieback;
or, one Huntley and Palmer breakfast biscuit.

Milk, warmed, six to eight ounces, from a cup.

2 P. M. Beef juice, one to two ounces; and one egg (soft boiled, poached or coddled); and boiled rice, one tablespoonful;
or, broth (mutton or chicken), four ounces; one or two Huntley and Palmer breakfast biscuits, or zwieback; and (if most of the teeth are present) rare scraped meat, at first one teaspoonful, gradually increasing to one tablespoonful.

Milk, four or five ounces.

6 P. M. Cereal: two tablespoonfuls of farina, cream of wheat or arrowroot, cooked for at least one half hour, with milk, plenty of salt, but without sugar.
Milk, warmed, eight to ten ounces, given from a cup.
10 P. M. Milk, warmed, eight to ten ounces, which may be given from a bottle.

Give a proper diet for an average child from the eighteenth month to the end of the second year.

The same order of meals as for the months just preceding should be followed. For most children milk at 10 P. M. is desirable. There are many, however, who sleep regularly from 6 P. M. until 6 A. M. without food; for such the night feeding should, of course, not be insisted upon.

The daily schedule should be about as follows:

6.30 A. M. Milk, warmed, ten to twelve ounces, given from cup.
9 A. M. Fruit juice, two to three ounces.
10 A. M. Cereals: similar to those given from the fourteenth to the eighteenth month; they need not be strained although they should be cooked and served in the same way.
Crisp dry bread, zwieback, or Huntley and Palmer biscuits, without butter.
Milk, warmed, one cup.
2 P. M. Beef juice and one egg;
or, broth and meat; care being taken that the meat is always rare and scraped or very finely divided; beefsteak, mutton chop, or roast beef may be given.
Very stale bread, or two pieces of zwieback.
Prune pulp or baked apple, one to two tablespoonfuls.
Water; no milk.

6 P. M. Cereal: farina, cream of wheat, or arrowroot, cooked for at least one half hour, with milk, plenty of salt, but without sugar.
or, milk toast or stale bread and milk.
10 P. M. If required, ten to twelve ounces of plain milk.

What fruits may be given at this period?

If the child has a feeble digestion, only the fruit juices previously allowed; strong children may have in addition prune pulp, baked apple, and apple-sauce. The prune pulp is prepared by stewing the dried prunes without sugar until they are very soft, and removing all the skin by putting the fruit through a strainer; of this from one to two table-spoonfuls may be given at one time. The baked apple should be given without cream, and the apple-sauce should have very little sugar.

How and when should water be given?

Throughout the second year water should be given freely between the feedings, especially in warm weather; from one to three ounces may be given at one time, either from a spoon, a glass, or a bottle. The water should be boiled daily and then cooled. It should not be allowed to stand in the room, but fresh water should be put into the bottle each time.

FEEDING DURING THE THIRD YEAR

What changes may be made in the diet during the third year?

The night feeding at 10 P. M. should be omitted. A greater quantity of solid food may be allowed, particularly at the mid-day meal. It is not advisable to begin potato and other vegetables until the age of two years is reached. Three regular meals should be given and milk once besides, either between the breakfast and dinner or dinner and supper, whichever is the longer interval. Water should be allowed freely between meals.

What would be a proper schedule for an average child during the third year?

7.30 A. M. Cereal: cooked (preferably over night) for three hours, although a somewhat larger variety may be given than during the second year; given as before with milk or thin cream, salt, but very little sugar.
Warm milk, one glass.
A soft egg, poached, boiled or coddled.
Bread, very stale or dry, one slice, with butter.

10 A. M. Warm milk, one cup, with a cracker or piece of very stale bread and butter.

2 P. M. Soup, four ounces;
or, beef juice, two ounces.
Meat: chop, steak, roast beef or lamb or chicken.
A baked white potato;
or, boiled rice or spaghetti; both cooked five hours.

Green vegetable: asparagus tips, string beans, peas, spinach; all to be cooked until very soft, and mashed, or preferably put through a sieve; at first, one to two teaspoonfuls.

Dessert: cooked fruit—baked or stewed apple, stewed prunes.

Water; no milk.

6 P. M. Cereal: farina, cream of wheat, or arrowroot, cooked for at least one half hour, with plenty of salt, but without sugar;

or, milk toast;

or, bread and milk;

or, stale or dry bread and butter and a glass of milk.

PART III

THE DIET OF OLDER CHILDREN

III

THE DIET OF OLDER CHILDREN

(FOURTH TO TENTH YEAR)

Throughout this period the largest meal should always be in the middle of the day, and a light supper given, very much like that described for the third year. During the first half of this period, milk may be allowed once either between breakfast and dinner or dinner and supper; no other eating between meals should be permitted, but water should be allowed freely.

MILK AND CREAM

What part of the diet should milk form during childhood?

It should form a very important part; nothing can take its place. There are comparatively few children who cannot take and digest milk if it is properly fed.

Why is milk so advantageous?

Because no food that we possess has so high a nutritive value as milk, for the amount of work re-

quired of the organs of digestion. It is, therefore, peculiarly adapted to the diet of the child.

What are the essential points in the use of milk?

It should be clean and fresh, but not too rich. It is a mistake to select for any children the rich milk of a Jersey herd and use it as though it were an ordinary milk. For children who have difficulty in digesting milk, it should be somewhat diluted, i. e., one part of water to four parts of milk, or salt or bicarbonate of soda should be added. It is also important not to give milk at meals when fruits, especially sour fruits, are allowed.

How much milk may advantageously be given?

The average child with good digestion should take from one and one half pints to one quart of milk daily, this including not only what the child drinks but what is served upon cereals and in other ways. It is seldom wise to allow a child to take as much as two quarts daily, as a more mixed diet for most children is better.

To what extent may cream be used?

Older children do not require so large a proportion of fat in their food as do infants, and the use of cream, especially very rich cream, often results in disturbances of digestion. The use of too much or too rich cream is a common cause of the coated

tongue, foul breath and pale gray stools, often called "biliousness."

Is not cream useful in overcoming the constipation of children?

With infants it is valuable to a certain point, but with older children only to a limited degree, and if such symptoms as those above described are present, cream should not be given.

EGGS

To what extent may eggs be used in the diet of this period?

They form a most valuable food. It is essential that they should be fresh and only slightly cooked, soft boiled, poached or coddled; fried eggs should not be given and omelets are objectionable.

Which is more digestible, the white or yolk of the egg?

For the great majority of children, the white of the egg. This forms one of the most digestible proteids we possess, and can be used, even in the latter part of the first year, with advantage.

Is it not true that eggs often cause "biliousness"?

Very seldom, if fed as above advised. This is an old prejudice but has little basis in fact.

How often may eggs be given?

Most children from four to ten years old will take one egg for breakfast and another for supper for an indefinite period with relish and benefit. There are, however, some few who have a peculiar idiosyncrasy as regards eggs and cannot take them at all.

MEAT AND FISH

What meats may be given to young children?

The best are beefsteak, mutton-chop, roast beef, roast lamb, broiled chicken and certain delicate fish, such as shad or bass.

What are the important points to be considered in giving meat to children?

Most meats should be rare and either scraped or very finely divided, as no child can be trusted to chew meat properly. Meats are best broiled or roasted, but should not be fried.

How often should meat be given?

At this period, only once a day, at the mid-day meal.

Is not the excessive nervousness of many modern children due to the giving of meat, or at least aggravated by its use?

There is little ground for such a belief, unless

an excessive amount of meat is given. Certainly cutting off meat from the diet of nervous children seldom produces any striking effect.

What meats should be forbidden to young children?

Ham, bacon, sausage, pork, liver, kidney, game and all dried and salted meats, also cod, mackerel and halibut; all of these are best withheld until the child has passed the tenth year.

Are not gravies beneficial and nutritious?

The beef juice, or so-called "platter gravy," from a roast is exceedingly nutritious and desirable, but many of the thickened gravies are much less digestible and are too often given in excess; only a small quantity should be allowed. They should not form an important part of the meal.

VEGETABLES

What vegetables may be used at this period?

White potatoes may be given first. These should preferably be baked or boiled and mashed, but not fried. They should be served with beef juice or with cream rather than with butter.

Of the green vegetables, the best are peas, spinach, asparagus tips, string beans, stewed celery, young beets, or carrots, and squash. Baked sweet

potato, turnips, boiled onions and cauliflower, all well cooked, may be given after the sixth or seventh year in moderate amount.

The principal trouble in the digestion of vegetables is due to imperfect cooking. It is, in fact, almost impossible to cook them too much; they should also be very finely mashed. They form a valuable addition to the diet after three years, although the amount at first given should be small, one or two teaspoonfuls. They greatly aid in securing regularity of the bowels. Because small particles are seen in the stools, it is not to be inferred that they are causing disturbance and should, therefore, be stopped, but only that they should be more thoroughly cooked and more finely divided before being given.

Is it safe to use canned vegetables for children?

Many of the best brands of canned vegetables are quite safe and some, such as peas and asparagus, can be used with advantage. They are frequently better than stale green vegetables often sold in the markets.

What vegetables should not be given to young children?

None of those which are eaten raw, such as

celery, radishes, onions, cucumbers, tomatoes or lettuce. Certain others, even when well cooked, should not be allowed; as corn, lima beans, cabbage, egg plant. None of these should be given until a child has passed the age of ten years.

Are vegetable salads to be given?

As a rule salads of all kinds should be omitted until a child has passed the tenth year. Salads are difficult to digest and a cause of much disturbance in children of all ages.

CEREALS

What are the most important points in selecting and preparing cereals?

The important things are that they are properly cooked and not used in excess. The ready-to-serve cereals should not be chosen for children, nor should a child, because he is fond of cereals, be allowed to make his entire meal of them, taking two or three saucerfuls at a feeding.

Many of the partially cooked preparations of oatmeal and wheat are excellent, but should be cooked for a much longer time than is stated upon the package, usually three or four times as long. Digestibility is chiefly a matter of proper cooking. Most of the grains,—oatmeal, hominy, rice, wheaten grits,—

require at least three hours' cooking in a double boiler in order to be easily digested. The prepared flours,—corn starch, arrowroot, barley,—should be cooked at least twenty minutes. I know of no preparation in the modern market which requires no cooking, which is to be recommended for children.

How are cereals to be given?

Usually with milk or a mixture of milk and cream; always with an abundance of salt and with very little or no sugar, one half teaspoonful on a saucerful of cereal should be the limit.

Cereals should not be served with sirups or butter and sugar.

BROTHS AND SOUPS

What broths and soups are to be recommended?

Meat broths are generally to be preferred to vegetable broths,—mutton or chicken being usually most liked by children. Nearly all plain broths may be given. Those thickened with rice, barley or corn starch form a useful variety, especially with the addition of milk.

Vegetable purées of peas, spinach, celery or asparagus may be used for children over seven years old. Tomato soup should not be given to young children.

BREAD, CRACKERS AND CAKES

What forms of breadstuffs are best suited to young children?

Fresh bread should not be given, but stale bread cut thin and freshly dried in the oven until it is crisp is very useful, also zwieback, the unsweetened being preferred. Oatmeal, graham or gluten crackers, and the Huntley and Palmer breakfast biscuits, stale rolls, or corn bread which has been split and toasted or dried till crisp, form a sufficient variety for most children.

What breadstuffs should be forbidden?

All hot breads, all fresh rolls, all buckwheat and other griddle cakes, all fresh sweet cakes, especially those covered with icing and those containing dried fruits. A stale lady-finger or piece of sponge cake is about as far in the matter of cakes as it is wise to go with children up to seven or eight years old.

DESSERTS

What desserts may be given to young children?

Mistakes are more often made here than in any other part of the child's diet. Up to six or seven years, only junket, plain rice pudding without

raisins, plain baked custard and, not more than once a week, a small amount of ice cream.

What should be especially forbidden?

All pies, tarts and pastry of every description, jam, sirups and preserved fruits; nuts, candy and dried fruits.

Does "a little" do any harm?

Yes, in that it develops a taste for this sort of food, after which plainer food is taken with less relish. Besides the "little" is very apt soon to become a good deal.

Does not the child's instinctive craving for sweets indicate his need of them?

That a child likes or craves sweets is the usual excuse of an indulgent parent. Every child likes his own way, but that is no reason why he should not be trained to obedience and self-control; a child's fondness for sweets can hardly be considered a normal instinct. As a matter of fact, supported by everyday experience, no causes are productive of more disorders of digestion than the free indulgence in desserts and sweets by young children. It is a constantly increasing tendency, not easily controlled as a child grows older; and in early childhood, the only safe rule is to give none at all.

FRUITS

Are fruits an essential or important part of the diet?

They are a very important part and should be begun in infancy. They are particularly useful for the effect they have upon the bowels. It is important that they should be selected with care and given with much discretion, especially in cities. In the country, where fruit is absolutely fresh, a somewhat greater latitude may be allowed than is given below.

What fruits may safely be given to children up to five years old?

As a general rule, only cooked fruits and the juices of fresh fruits.

What fruit juices may be used?

That from sweet oranges is the best, but the fresh juice of grape fruit, peaches, strawberries and raspberries may also be used.

What cooked fruits may be given?

Stewed or baked apples, prunes, pears, peaches and apricots.

What raw fruits are to be particularly avoided with young children?

The pulp of oranges or grape fruit, also cherries, berries, bananas and pineapple.

What precautions should be emphasized regarding the use of fruits?

That they should be used with greater care in hot weather and with children who are prone to attacks of intestinal indigestion.

What symptoms indicate that fruits should be avoided?

A tendency to looseness of the bowels with the discharge of mucus, or frequent attacks of abdominal pain or stomach-ache.

Is there any special choice of meals at which fruit should be given?

The fruit juice given early in the morning, upon an empty stomach, works more actively upon the bowels than if it is given later in the day.

It is not, as a rule, wise to give cream or milk with sour fruits. Usually the fruit is best given at the mid-day meal, as a dessert, at a time when no milk is taken. It is in all cases important that the quantity of fruit should be moderate.

What besides water and milk should a child be allowed to drink and what should be forbidden?

Tea, coffee, wine, beer and cider in all quantities and in all forms should be forbidden to young children below puberty. Cocoa which is made very weak, i. e., almost all milk, is often useful as a hot

drink. Lemonade, soda-water, etc., should if possible be deferred until the tenth year. A free indulgence in things of this kind should never be permitted with children of seven or eight years.

INDIGESTION IN OLDER CHILDREN

What are the different ways in which indigestion shows itself in children?

First, in acute disturbances which last for a few days only; and, secondly, in chronic disturbances which may continue for weeks or months.

Which of the two forms of indigestion is more likely to impair seriously the health of the child?

Chronic indigestion; for since the cause is not recognized it often goes on for months and even years unchecked.

What are the symptoms of acute indigestion?

These are familiar and easily recognized. They are vomiting, pain, undigested movements from the bowels, often fever and considerable prostration.

Such attacks are usually traceable to their proper cause, the removal of which is followed by prompt recovery.

What are the common causes of acute indigestion?

This is frequently due to overeating, to indulgence in some special article of improper food, or to eating heartily when overtired. Acute indigestion often marks the beginning of some acute general illness.

How should acute indigestion be managed?

One should bear in mind that for the time being the digestive organs have stopped work altogether. The important thing, therefore, is to clear out from the intestines all undigested food by some active cathartic, such as castor oil. The stomach has usually emptied itself by vomiting. All food should be stopped for from twelve to thirty-six hours, according to the severity of the attack, only water being given.

At the end of this time is it safe to begin with the former diet?

No; for such a procedure is almost certain to cause another attack of indigestion. At first only broth, thin gruel, very greatly diluted milk, or whey should be given. The diet may be very slowly but gradually increased as the child's appetite and digestion improve, but in most cases a week or ten days should elapse before the full diet is resumed.

What are the symptoms of chronic indigestion?

These, although familiar, are not so easily distinguished and are very often attributed to the wrong cause. There are usually general symptoms such as indisposition, disturbed sleep, grinding of the teeth, fretfulness, languor, loss of weight and anæmia. There are besides local symptoms: flatulence, abdominal pain, abdominal distention, constipation, or looseness of the bowels with mucus in the stools, foul breath, coated tongue, loss of appetite, or an abnormal, capricious appetite. Such symptoms are often wrongly ascribed to intestinal worms.

What are the common causes of chronic indigestion?

This is generally the result of a bad system of feeding, either the prolonged use of improper food or of improper methods of feeding.

Examples of bad methods of feeding are, coaxing or forcing to eat, rapid eating with insufficient mastication, eating between meals, allowing a child to have his own way in selecting his food, as when he lives largely upon a single article of diet. Things to be considered under the head of improper food are, indulgence in sweets, desserts, etc., the use of imperfectly cooked foods, especially cereals and vegetables, and of raw or stale fruits.

Is it not true that a diet or a special article of food which does not make a child ill is proof that such a diet or such a food is proper for a child?

By no means; with many people the only guide in feeding children is that the article in question did not make the children sick, therefore it is allowable. This is a very bad principle. A better one is to adopt such a diet as will nourish the child's body with the least possible tax upon his digestive organs; in other words, to exclude articles which experience has shown to be injurious to most children.

How should chronic indigestion be managed?

This is a much more difficult matter than the treatment of acute indigestion, for, as it is usually the result of the prolonged use of improper food or of an improper method of feeding, a cure can be accomplished only by a discovery and removal of the cause.

Is chronic indigestion curable?

In the vast majority of cases it is so, but only by faithfully observing for a long period the rules for simple feeding laid down elsewhere. One of the greatest difficulties in the way of recovery is that parents and nurses are unwilling to follow a

restricted diet long enough to secure a complete cure, or to change radically their methods of feeding, but expect the child to recover by simply taking medicine.

For how long a period is it necessary to continue very careful feeding?

In any case it must be done for several months; with most children for two or three years; with some, throughout childhood, for with them the slightest deviation from established rules is sure to provoke a relapse.

Is not medicine useful?

It is undoubtedly of assistance for the relief of some symptoms, but the essential thing is proper feeding, without which nothing permanent can be accomplished.

GENERAL RULES TO BE OBSERVED IN FEEDING

Bad habits of eating are readily acquired but difficult to break.

Young children should not be allowed to play with their food, nor should the habit be formed of amusing or diverting them while eating, because by these means more food is taken.

Older children should not be permitted to make an entire meal of one thing, no matter how proper this may be.

Children who are allowed to have their own way in matters of eating are very likely to be badly trained in other respects; while those who have been properly trained in their eating can usually be easily trained to do anything else that is important.

Learning to eat proper things in a proper way forms, therefore, a large part of a child's early education. If careful training in these matters is begun at the outset and continued, the results will well repay the time and effort required.

Whether the child feeds himself or is fed by the nurse, the following rules should be observed:

1. Food at regular hours only; nothing between meals.

2. Plenty of time should be taken. On no account should the child bolt his food.

3. The child must be taught to chew his food. Yet no matter how much pains are taken in this respect, mastication is very imperfectly done by all children; hence up to the seventh year at least, all meats should be very finely cut, all vegetables mashed to a pulp, and all grains cooked very soft.

4. Children should not be continually urged to

eat if they are disinclined to do so at their regular hours of feeding, or if the appetite is habitually poor, and under no circumstances should a child be forced to eat.

5. Indigestible food should never be given to tempt the appetite when the ordinary simple food is refused; food should not be allowed between meals because it is refused at meal-time.

6. One serious objection to allowing young children highly seasoned food, entrées, jellies, pastry, sweets, etc., even in such small amounts as not to upset the digestion, is that children thus indulged soon lose appetite for the simple food which previously was taken with relish.

7. If there is any important article of a simple diet such as milk, meat, cereals, or vegetables, which a child habitually refuses, this should always be given first at the meal and other food withheld until it is disposed of. Children so readily form habits of eating only certain things and refusing others that such an inclination should be checked early.

8. If an infant refuses its food altogether, or takes less than usual, the food should be examined to see if this is right. Then the mouth should be inspected to see if it is sore. If neither of these things is the cause, the food should be taken away

and not offered again until the next feeding time comes.

9. In any acute illness the amount of food should be much reduced and the food made more dilute than usual. If there is fever, no solid food should be given. If the child is already upon a milk diet, this should be diluted.

10. In very hot weather the same rules hold, to give less food, particularly less solid food, and more water.

FOOD FORMULAS

Beef Juice.—One pound of rare round steak, cut thick, slightly broiled, and the juice pressed out by a lemon-squeezer, or, better, a meat-press. From two to four ounces of juice can generally be obtained. This, seasoned with salt, may be given cold, or warmed by placing the cup which holds it in warm water. It should not be heated sufficiently to coagulate the albumin which is in solution, and which then appears as flakes of meat floating in the fluid.

Beef Juice by the Cold Process.—One pound of finely chopped round steak, six ounces of cold water, a pinch of salt; place in a covered jar and stand on ice or in a cold place, five or six hours or overnight. It is well to shake occasionally. This is now

strained and all the juice squeezed out by placing the meat in coarse muslin and twisting it very hard. It is then seasoned and fed like the above.

Beef juice so made is not quite as palatable as that prepared from broiled steak, but it is even more nutritious, and is more economical, as fully twice as much juice can be obtained from a given quantity of meat. Beef juice prepared in either of these ways is greatly to be preferred to the beef extracts sold.

Mutton Broth.—One pound of finely chopped lean mutton, including some of the bone, one pint cold water, pinch of salt. Cook for three hours over a slow fire down to half a pint, adding water if necessary; strain through muslin, and when cold carefully remove the fat, adding more salt if required. It may be fed warm, or cold in the form of a jelly.

A very nutritious and delicious broth is made by thickening this with cornstarch or arrowroot, cooking for ten minutes and then adding three ounces of milk, or one ounce of thin cream, to a half pint of broth.

Chicken, Veal, and Beef Broths.—These are made and used in precisely the same manner as mutton broth.

Scraped Beef or Meat Pulp.—A piece of rare round or sirloin steak, the outer part having been cut away, is scraped or shredded with a knife; one teaspoonful to one tablespoonful may be given, well salted, to a child of eighteen months. Scraping is much better than cutting the meat fine.

For this on a large scale, as in institutions, a Hamburg-steak cutter may be employed.

Junket, or Curds and Whey.—One pint of fresh cow's milk, warmed; pinch of salt; a tablespoonful of granulated sugar; add two teaspoonfuls of Fairchild's essence of pepsin, or liquid rennet, or one junket tablet dissolved in water; stir for a moment, and then allow it to stand at the temperature of the room for twenty minutes, or until firmly coagulated; place in the ice box until thoroughly cold. For older children this may be seasoned with grated nutmeg.

Whey.—The coagulated milk prepared as above is broken up with a fork and the whey strained off through muslin. If some stimulant is desired, sherry wine, in the proportion of one part to twelve, may be added. Whey is useful in many cases of acute indigestion.

Barley Water.—One level tablespoonful of Robinson's patent barley, or the prepared barley flour

of the Health Food Company, is thoroughly blended with a little cold water and added, stirring, to one pint of boiling water containing a pinch of salt. This is cooked for thirty minutes in a double boiler and then strained. Enough boiled water should then be added to bring the whole up to one pint.

Barley Gruel or Barley Jelly.—This is made in the same manner as the above but from two to four level tablespoonfuls of the flour are used according to the thickness of the gruel desired.

Either barley water or barley jelly may be made from the grains. For barley water, use one heaping tablespoonful of pearl barley which has been soaked four or five hours, or overnight, one pint of water, a pinch of salt. This is boiled steadily for four hours, adding water from time to time to keep the quantity up to one pint. It is then strained through muslin.

For barley gruel or barley jelly use from two to four tablespoonfuls of pearl barley.

Rice, Wheat, or Oat Water.—These are made from rice, wheat, or oat flour exactly as barley water, above described. Like the barley water they may also be made from the grains, using the same proportions.

Gruel or Jelly from Rice, Wheat, or Oats.—These are made from the flours or grains as has been described for barley gruel.

For the wheat preparations, ordinary wheat flour may be used or Hubbell's prepared wheat flour; or wheaten grits may be employed.

For the rice preparations the ordinary rice grains or rice flour may be used.

For the oat preparations, either the oat flour of the Health Food Company may be used, or any of the commonly employed forms of oatmeal.

When any of these farinaceous foods are to be mixed with milk, the milk should be added directly after removing the gruel from the fire, and stirred two or three minutes.

Albumin Water.—The white of one fresh egg; half a pint of cold water; pinch of salt; teaspoonful of brandy. This should be shaken thoroughly and fed cold either with a spoon or from a bottle. It is useful in cases of vomiting, and can sometimes be retained by a very irritable stomach.

Lime-Water.—One heaping teaspoonful of slaked lime; one quart boiled or distilled water; place in a corked bottle and shake thoroughly two or three times during the first hour. The lime should then be allowed to settle, and after twenty-four hours

the upper clear fluid carefully poured or siphoned off for use.

Dried Bread.—Either stale or fresh bread may be used; it is cut in thin slices and placed in the oven, with the door open, and quickly dried until it is crisp, but not browned. It is in many respects preferable to crackers for little children.

Coddled Egg.—A fresh egg, shell on, is placed in boiling water which is immediately after removed from the fire. The egg then cooks slowly in the water, which gradually cools, for seven or eight minutes, when the white should be about the consistency of jelly. For a delicate digestion the white only should be given, with salt; it can be easily separated from the yolk.

PART IV

MISCELLANEOUS

IV

MISCELLANEOUS

THE BOWELS

How many movements daily should an infant have during the first few weeks of life?

Usually two or three a day for the first week, and then one or two each day.

How many after a child is a month old?

A healthy child should have at least one movement each day; many have two and some more than two; but it is the character of the stools rather than their number which is to be taken as the evidence of perfect digestion.

What is the appearance of a healthy movement of a child who is taking nothing but milk?

It is soft, yellow, and smooth, containing no lumps.

When are the stools dark brown or black?

While taking bismuth, iron, and sometimes when taking much meat or beef juice; also while taking many of the prepared foods. They may be dark

brown or black from blood. This last is a condition which may indicate serious illness.

How may a child be trained to be regular in the action of its bowels?

By endeavoring to have them move at exactly the same time every day.

At what age may an infant be trained in this way?

Usually by the second month if training is begun early.

What is the best method of training?

A small chamber, about the size of a pint bowl, is placed between the nurse's knees, and upon this the infant is held, its back being against the nurse's chest and its body firmly supported. This should be done twice a day, after the morning and afternoon feedings, and always at the same hour. At first there may be necessary some local irritation, like that produced by tickling the anus or introducing just inside the rectum a small cone of oiled paper or a piece of soap, as a suggestion of the purpose for which the baby is placed upon the chamber; but in a surprisingly short time the position is all that is required. With most infants after a few weeks the bowels will move as soon as the infant is placed on the chamber.

What advantage has such training?

It forms the habit of having the bowels move regularly at the same hour, which is a matter of great importance in infancy and makes regularity in childhood much easier. It also saves the nurse much trouble and labour.

SLEEP

Should a child sleep in the same bed with its mother or nurse?

Under no circumstances, if this can possibly be avoided. Very young infants have often been smothered by their mothers by overlying during sleep. If the infant sleeps with the mother, there is always the temptation to frequent nursing at night, which is injurious to both mother and child. Older children also should, if possible, have separate beds; many contagious diseases and bad habits are contracted by children sleeping together.

How should an infant's bed be prepared?

The mattress should be firm but soft, the pillow very thin, and the covering not excessive. A baby should not be allowed to sleep always in the same position, but should be changed from side to side. Hair pillows are useful in summer and for children who perspire very much.

How much sleep is natural for a newly-born baby?

A baby with a good digestion and proper food will usually sleep at this period about nine tenths of the time.

How much should a baby sleep at six months?

About two thirds of the time.

Up to what age should an older child take a nap during the day?

Always until four years old, and if possible until seven or eight years old.

At what age may an infant go all night without feeding?

After five months a healthy child should not be fed or nursed between 10 P. M. and 6 A. M. Some children at this age habitually go from 6 P. M. to 6 A. M. without feeding, and thrive well on this regime.

At two years a child can easily go from 6 P. M. to 6 A. M. without feeding.

How should a baby be put to sleep?

The room should be darkened and quiet, the child's hunger satisfied, and the child made generally comfortable and laid in its crib while awake.

Is rocking necessary?

By no means. It is a habit easily acquired, but

hard to break, and a very useless and sometimes injurious one. The same may be said of sucking a rubber nipple, or "pacifier," and all other devices for putting children to sleep.

What are the principal causes of disturbed sleep?

As quiet peaceful sleep is a sign of perfect health, disorders of sleep may be produced by almost anything which is wrong with the child.

1. Habitual disturbance of sleep in infants is most frequently associated with the food or feeding. It may be from the discomfort of chronic indigestion due to improper food. In bottle-fed infants it is often the result of overfeeding; in those who are nursed it is often due to hunger. A common cause is frequent night feeding; an infant who is fed three or four times during the night is almost invariably a bad sleeper.

2. Disturbed sleep or sleeplessness may be due to causes purely nervous. Such are bad habits acquired by faulty training; as when the nursery is lighted and the child taken from its crib whenever it wakes or cries; or when some of the contrivances for inducing sleep have been used. Any excitement or romping play just before bedtime, and fears aroused by pictures or stories, are frequent causes.

Children who inherit from their parents a nervous constitution are especially likely to suffer thus.

3. There may be physical discomfort from cold feet, insufficient or too much clothing, or want of fresh air in the sleeping room.

4. Interference with breathing due to obstruction from large tonsils or adenoids. These cause great restlessness and lead a child to assume many different postures during sleep, often lying upon the face or upon the hands and knees.

5. Chronic pains or frequently recurring night pains may be causes of disordered sleep, when a child wakes with a sudden sharp cry. In infants this is most often due to scurvy, sometimes to syphilis. In older children it may be the earliest symptom of disease of the hip or spine.

6. Sleeplessness and disturbed sleep are frequent whenever the general condition falls much below a healthy standard; e. g., in infants who are not thriving and in children suffering from marked anæmia.

How are children who sleep too little, or whose sleep is constantly disturbed, to be treated?

Never by the use of soothing sirups or other medicines. Successful treatment consists in the discovery and removal of the cause.

Do children ever sleep too much?

It is doubtful if healthy children ever do. Excessive sleep is an important symptom of some diseases of the brain. Otherwise it seldom if ever occurs unless soothing sirups or other drugs have been given.

EXERCISE

Is exercise important for infants?

It is as necessary for them as for older children.

How is it obtained?

A young baby gets its exercise by screaming, waving its arms, kicking, etc. The clothing should not be so tight as to make these movements impossible. At least twice a day the infant should be allowed for fifteen or twenty minutes the free use of its limbs by permitting it to lie upon a bed in a warm room, with all clothing except the shirt, stockings, and napkin removed. Later, when in short clothes, the baby may be put upon a thick blanket or quilt laid upon the floor, and be allowed to tumble about at will. A nursery pen two feet high, made to surround a mattress, is an excellent device and makes a convenient box stall for the young animal, where it can learn to use both its arms and legs with-

out the danger of injury. Only by exercise such as this do the muscles have an opportunity to develop properly.

THE CRY

When is crying useful?

In the newly born infant the cry expands the lungs, and it is necessary that it should be repeated for a few minutes every day in order to keep them well expanded.

How much crying is normal for a very young baby?

From fifteen to thirty minutes a day is not too much.

What is the nature of this cry?

It is loud and strong. Infants get red in the face with it; in fact, it is a scream. This is necessary for health. It is the baby's exercise.

When is a cry abnormal?

When it is too long or too frequent. The abnormal cry is rarely strong, often it is a moaning or a worrying cry, sometimes only a feeble whine.

What are the main causes of such crying?

Pain, temper, hunger, illness, and habit.

What is the cry of pain?

It is usually strong and sharp, but not generally continuous. It is accompanied by contraction of the features, drawing up of the legs, and other symptoms of distress.

What is the cry of hunger?

It is usually a continuous, fretful cry, rarely strong and lusty.

What is the cry of temper?

It is loud and strong and accompanied by kicking or stiffening of the body, and is usually violent.

What is the cry of illness?

There is usually more of fretfulness and moaning than real crying, although crying is excited by very slight causes.

What is the cry of indulgence or from habit?

This is often heard even in very young infants, who cry to be rocked, to be carried about, sometimes for a light in the room, for a bottle to suck, or for the continuance of any other bad habit which has been acquired.

How can we be sure that a child is crying to be indulged?

If it stops immediately when it gets what it wants, and cries when it is withdrawn or withheld.

What should be done if a baby cries at night?

One should get up and see that the child is comfortable—the clothing smooth under the body, the hands and feet warm, and the napkin not wet or soiled. If all these matters are properly adjusted and the child simply crying to be taken up, it should not be further interfered with. If the night cry is habitual some other cause should be sought.

How is an infant to be managed that cries from temper, habit, or to be indulged?

It should simply be allowed to "cry it out." This often requires an hour, and, in extreme cases, two or three hours. A second struggle will seldom last more than ten or fifteen minutes, and a third will rarely be necessary. Such discipline is not to be carried out unless one is sure as to the cause of the habitual crying.

Is it likely that rupture will be caused from crying?

Not in young infants if the abdominal band is properly applied, and not after a year under any circumstances.

LIFTING CHILDREN

How should a young baby be lifted from its bed?

The right hand should grasp the clothing below

the feet, and the left hand should be slipped beneath the infant's body to its head. It is then raised upon the left arm.

What is the advantage of this?

The entire spine is supported, and no undue pressure is made upon the chest or abdomen, as often happens if the baby is grasped around the body or under the arms.

How should a child old enough to run about be lifted?

Always by placing the hands under the child's arms, and never by the wrists.

What injury may be inflicted by lifting the child by the wrists or hands?

Often serious injury is done to the elbow or shoulder joints.

THE TEMPERATURE

What is the normal temperature of an infant?

The normal temperature varies more than in adults. In the rectum it usually fluctuates between 98° and 99.5° F.; a rectal temperature of 97.5° F. or of 100.5° F. is of no importance whatever unless it continues.

Where should the temperature of infants and young children be taken?

The rectum is altogether the best place, and next to this the groin. The rectal temperature is from half a degree to a degree higher than that in the groin.

How long should the thermometer be left in place to take the temperature?

Two minutes in the rectum, and five minutes in the groin.

Is the temperature of a young child a good guide as to the severity of its symptoms in illness?

As a rule it is. A temperature of 100° to 102° F. commonly means a mild illness, and one of 104° F. or over a serious one. The duration of the fever is, however, even more important than the height of the temperature. It should be remembered that in all young children slight causes often produce a high temperature which lasts for a few hours; one should not therefore be unduly alarmed unless the temperature continues high, or is accompanied by other important signs of illness.

Is not a high temperature a more serious symptom in a young child than in an adult?

The opposite is rather the case. Young children are extremely sensitive to conditions which produce

fever, and the thermometer often gives an exaggerated idea of the severity of the symptoms. A cause which in an adult might produce a temperature of 102° F. or 103° F. in a young child would very likely be accompanied by a temperature of 104° or 105° F.

NERVOUSNESS

What are the principal causes of excessive nervousness in infants and young children, and what can be done to prevent this?

The most important cause is the delicate structure of the brain at this time, and its rapid growth. It grows as much during the first year as during all the rest of life. This requires quiet and peaceful surroundings. Infants who are naturally nervous should be left much alone, should see but few people, should be played with very little, and should never be quieted with soothing sirups or the "pacifier."

At what age may playing with babies be begun?

Babies under six months old should never be played with; and the less of it at any time the better for the infant.

What harm is done by playing with very young babies?

They are made nervous and irritable, sleep

badly, and suffer from indigestion and in many other respects.

When may young children be played with?

If at all, in the morning, or after the mid-day nap; but never just before bedtime.

TOYS

What points should guide one in selecting toys and playthings for an infant?

The instinct in a baby to put everything into the mouth is so strong that nothing should be given that cannot be safely treated in this way. Hence one should choose things which are smooth, those which can be easily washed, and those which cannot be swallowed.

One should avoid (1) toys with sharp points or corners; (2) those with loose parts that might be detached or broken off and swallowed; (3) small objects which might be swallowed or pushed into the nose or ear, such as coins, marbles, and safety-pins, also beads and buttons unless strung upon a stout cord; (4) painted toys; (5) those covered with hair or wool. Infants have often been severely injured by swallowing what they have pulled off from their small toy animals.

What points are to be considered in selecting the toys and playthings of a child over two years old?

It should be remembered that toys are not merely a source of amusement, but that they have an educational value as well. Those are therefore to be preferred the use of which develops the child's imagination, and with which he can be taught to amuse himself. For boys nothing can surpass blocks, toy soldiers, balls, engines and trains of cars; and for girls, dolls and housekeeping sets. The complicated mechanical toys now so much in vogue usually give only a momentary pleasure, and as soon as the wonder at their operation has worn off, they have lost interest for the child except that which he gets in breaking them to see how the thing worked.

What important things can be taught children with their toys and how may this be done?

The imagination may be developed, and children may be trained to habits of neatness, order and regularity, and to concentration of mind.

To this end toys should be kept in an orderly way upon a shelf in the nursery or in a closet, never piled in a miscellaneous heap in the corner of the room. Children should select their toys and play with one thing at a time, which they should

be taught to put away in its place before another is given. They should never be allowed to have a dozen things strewn about the room at one time, with none of which they are occupied.

KISSING

Are there any valid objections to kissing infants?

There are many serious objections. Tuberculosis, diphtheria, syphilis, and many other grave diseases may be communicated in this way. The kissing of infants upon the mouth by other children, by nurses, or by people generally, should under no circumstances be permitted. Infants should be kissed, if at all, upon the cheek or forehead, but the less even of this the better.

CONVULSIONS

What should be done for a child in convulsions before a doctor arrives?

Keep the child perfectly quiet with ice at the head, put the feet in a mustard bath, and roll the entire body in large towels which have been dipped in mustard water (two heaping tablespoonfuls of mustard to one quart of tepid water), and have

plenty of hot water and a bath tub at hand, so that the doctor can give a hot bath if he thinks it advisable.

When is a hot bath useful?

If the convulsions have continued until the pulse is weak, the face very pale, the nails and lips blue, and the feet and hands cold, the hot bath will be useful by bringing blood to the surface and relieving the heart, lungs, and brain.

How should the bath be given?

The temperature should not be over 106° F.; this should always be tested by a thermometer if one can be obtained. Without this precaution, in the excitement of the moment, infants have frequently been put into baths so hot that serious and even fatal burns have been produced. If no thermometer is available the nurse may plunge her arm to the elbow into the water. It should feel warm, but not so hot as to be at all uncomfortable. One half a teacupful of powdered mustard added to the bath often adds to its efficacy.

FOREIGN BODIES

What should be done if a foreign body has been swallowed?

First, examine the throat with the finger. If it has lodged there remove it. If it has passed from

the throat it has usually gone into the stomach. Next be sure that the object has actually been swallowed. Often needless alarm is allayed by finding in the child's crib or elsewhere the thing supposed to have been swallowed. The stools should be examined daily to see if the foreign body passes the bowel.

What further treatment is needed?

Give the child plenty of dry food, like bread, potato, etc., but under no circumstances either an emetic or cathartic. An infant may have its usual food.

What harm would a cathartic do?

It is likely to hurry the foreign body too rapidly through the intestine and in this way do harm; otherwise it becomes coated with fæcal matter and passes the intestine usually without doing injury.

Not only smooth objects such as buttons or coins are taken care of in this manner, but even sharp and pointed objects such as safety pins are usually passed through the bowel without causing pain or inflicting any injury.

How long a time is required for a foreign body to pass the bowel?

In most cases but three or four days, occasionally a week or ten days.

What should be done if a child gets a foreign body into the ear?

Unless this can easily be removed with the fingers it should not be meddled with, for it is likely to be pushed farther into the ear. The child should be taken to a physician.

What should be done if there is a foreign body in the nose?

The child should blow his nose strongly while the empty nostril is compressed. Unless this removes it a physician should be called. Meddlesome interference is always harmful.

COLIC

What are the symptoms of colic?

There is a strong, hard cry, which comes suddenly and returns every few minutes. With this there is drawing up of the feet, contraction of the muscles of the face, and other signs of pain. The abdomen is usually tense and hard.

What should be done for a baby with colic?

First, see that the feet are warm. Place them against a hot-water bag, or hold them before an open fire; apply a hot flannel to the abdomen, or let the child lie upon its stomach across a hot-water bag. If the colic continues, a half teacupful of warm

water containing ten drops of turpentine may be injected into the bowels with a syringe; at the same time the abdomen should be gently rubbed so as to start the wind. If the gas is in the stomach, half of a soda mint tablet may be given in a tablespoonful of very warm water.

EARACHE

What are the symptoms of earache?

The pain is generally severe and accompanied by a sharp scream; the child often puts the hand to the affected ear, or cries whenever it is touched. The pain is likely to be prolonged and continuous.

How should a child with earache be treated?

The ear should be irrigated with a solution of boric acid (twenty grains to the ounce) as warm as can be borne. Dry heat may then be applied in several ways. The ear having been first covered with cotton, a small hot-water bag or one filled with hot salt or bran may be bound over it with a bandage; or a small butter plate heated in hot water may be used in the same way. The hot-water bag may be held against the ear or the child may lie with his head upon it. The use of such substances as oil and laudanum in the ear is not to be recommended.

CROUP

What are the symptoms of croup?

There is a hollow, dry, barking cough, with some difficulty in breathing.

When is this likely to come on?

Usually at night.

Is simple croup dangerous?

The ordinary croup of infants is spasmodic croup, and is very rarely dangerous, although the symptoms seem very alarming.

What are the symptoms?

In a mild attack there is simply noisy breathing, especially on drawing in the breath, with a tight, barking, or croupy cough. In a severe attack the child's breathing is more noisy and becomes difficult.

What is the dangerous form of croup?

Membranous croup, which is the same thing as diphtheria of the larynx.

How does this develop?

Gradually; very rarely does it come on suddenly.

What should be done for a baby who has spasmodic croup?

The room should be very warm, hot clothes or

poultices should be applied over the throat, and either a croup kettle or an ordinary tea-kettle kept boiling in the room. This is more efficacious if the child is placed in a tent made by a raised umbrella with a sheet thrown over it, and the steam introduced beneath the tent. If the symptoms are urgent, ten drops of the sirup of ipecac should be given every fifteen minutes until free vomiting occurs. Whenever the symptoms reach a point where breathing becomes difficult, a doctor should be summoned without delay.

CONTAGIOUS DISEASES

What are the first symptoms of measles?

Measles comes on rather gradually with cough, sneezing, watery eyes and nose, much like an ordinary severe cold in the head. The eruption appears after three or four days, first upon the face and neck as small red spots, and spreads slowly over the body.

Is measles a serious disease?

In infants and during the winter season it is likely to be very serious on account of the danger of bronchitis and pneumonia, which frequently accompany it. In children over four years old it is generally not severe. No child should be voluntarily

exposed to this disease, and particularly one who is delicate or prone to disease of the lungs should be protected against it.

When and how is measles contagious?

Measles may readily be conveyed from the very beginning of the catarrh, two or three days before any eruption is present. It is very seldom carried by healthy persons. Its poison does not cling long to a sick room.

What is German measles?

German measles, or rubella, is a distinct disease and has nothing to do with ordinary measles. It is extremely rare for a child to be very ill with it. There is usually a very extensive eruption which may cover the body, but few other symptoms.

What are the first symptoms of scarlet fever?

Generally it comes abruptly, with vomiting, high fever, and sore throat. The eruption usually appears within twenty-four hours as a red blush, first upon the neck and chest, and spreads rapidly.

When and how is scarlet fever contagious?

Scarlet fever is only slightly contagious for the first one or two days of the attack. It is most contagious at the height of the disease and during desquamation. Mild cases are quite as contagious

as severe ones. In fact it is by the mild unrecognized cases that the disease is very often spread. It may be carried by clothing or bedding from the sick room and, though infrequently, by healthy persons who have been in contact with cases.

How does whooping-cough begin?

For a week or ten days it cannot be distinguished from the cough due to an ordinary cold on the chest. Then the attacks of coughing gradually become more severe, especially at night, the child gets red in the face, the eyes water with the paroxysm and vomiting may follow. After a severe coughing fit the breath is caught with a peculiar noise known as the "whoop."

How does chicken-pox begin?

It usually comes out gradually, as widely scattered pimples over the scalp, face, and body, many of which soon become small vesicles, resembling tiny blisters and afterwards dry to form crusts. There is itching and local discomfort but little fever, and the child rarely seems to be very ill.

How does diphtheria begin?

Sometimes suddenly, but usually gradually, with sore throat and swelling of the glands of the neck, with white patches upon the tonsils, or a free discharge, which may be bloody, from the nostrils.

How does mumps begin?

As a swelling upon the jaw, just beneath the ear. As it increases it extends forward upon the cheek and backward behind the ear. It may affect one or both sides.

Mumps is not very common in young children, and in them it is usually mild. After twelve or thirteen years it is likely to be more severe.

How long after exposure do the first symptoms appear in the different diseases?

In scarlet fever in from two to five days, rarely as late as a week; in measles in from nine to fourteen days, occasionally as late as twenty days; in whooping-cough in from one to two weeks; in chicken-pox in from fourteen to sixteen days; in German measles in from ten to sixteen days. In diphtheria the time varies much; it may be only one day, and it may be one or two weeks. In mumps it is usually a little less than three weeks, the average being twenty days.

Which of these diseases are most contagious?

Measles and chicken-pox are very contagious, and very few children who have not had them can come near a person suffering from either disease without taking it. Whooping-cough is almost as contagious as measles, and for young babies even more

so. A very close exposure is not necessary in the case of either of these diseases, and whooping-cough can undoubtedly be contracted in the open air. Scarlet fever and diphtheria are much less contagious; for both of these a pretty close exposure is necessary.

How long should a child with any of these diseases be kept away from other children?

With measles, for two weeks after the rash has gone; with scarlet fever, for at least four weeks after the rash has gone, and longer if the peeling is not over or if the ears are running; with whooping-cough, for two months, or so long as the paroxysmal cough continues; with chicken-pox, until all crusts have fallen off, or for about three weeks after the eruption appears; with German measles for one week after the eruption has faded; with diphtheria, at least ten days after the throat is well in a very mild case, and four weeks if the case has been severe or until cultures show the throat to be free from the diphtheria germs; with mumps for one week after the swelling has gone.

What should be done when a child shows the first symptoms of serious illness?

The child should be put to bed. If it is an infant, the food should be diluted to one half the

usual strength; if an older child, only fluid food should be given. If the child seems feverish, take the temperature. If the bowels are constipated, give a teaspoonful of castor oil, but no other medicine without the doctor's orders. Send for the doctor at once, and until he comes carefully exclude all other children from the room.

By what nursery training may the examination and treatment of sick children be made much easier?

By teaching all children to gargle, to show the throat, to take pills, and by constantly teaching them to regard the doctor as the child's best friend, and his visits as a great treat. On no account should a child be frightened into obedience by threats of what the doctor will do.

With care and patience most children may be taught to gargle and take pills at four or five years, and to show the throat willingly at two or three. All these matters should be made a part of the child's education.

SCURVY

What is scurvy and how is it produced?

Scurvy is a disease of general nutrition, usually caused by the long-continued use of improper food. Most of the cases come from the use of the prepared

infant's foods sold in the stores, especially when they are given without fresh milk; occasionally the use of condensed milk and of sterilized milk is followed by scurvy; sometimes it is seen when, owing to feeble digestion, it has been necessary to make cow's milk very weak for a long time.

What symptoms are seen in an infant with scurvy?

At first there is only indefinite and occasional soreness in the legs so that the child cries out when handled. As this soreness becomes more severe the child is often thought to have rheumatism. The gums swell and are of a deep purple colour. There may be bleeding from the gums, nose, bowels, or black-and-blue spots may be seen upon the legs. The ankles and knees may swell. The child grows very pale, loses appetite and weight, and sleeps badly.

What should be done when an infant shows signs of scurvy?

The diet should at once be changed to fresh milk, properly modified according to the child's digestion, but not sterilized or pasteurized. The juice of a sweet orange should be given, best about an hour before the feeding. At first three or four teaspoonfuls, four or five times a day; later, more may be given if the symptoms are not improved.

Properly treated an infant with scurvy generally recovers promptly and completely. If not recognized, or untreated, it may cause death.

CONSTIPATION

When it is necessary to move the bowels immediately, what are some of the easiest methods?

An injection of one tablespoonful of sweet oil may be given, or half a teaspoonful of glycerine in one tablespoonful of water, or a teacupful of tepid soap and water, or a glycerine suppository. None of these should be continued excepting under the physician's directions.

What sort of a syringe is to be preferred for giving an injection to an infant?

The bulb syringe is the simplest; this consists of an oval bulb of soft rubber and a soft rubber or a hard rubber tip. It holds one or two ounces.

What is the most essential thing in preventing or overcoming constipation?

The formation of the habit of having the bowels move every day regularly at the same hour, and proper early training (see page 160).

What is the best hour?

In most cases immediately after the first meal in the morning.

What are some simple means by which constipation may be relieved?

The best are diet, suppositories, and massage.

The changes to be made in the milk of constipated infants have been mentioned on page 96. The addition to the milk of some of the preparations of maltose mentioned on page 65 is often useful. For little children the fruit juices are particularly beneficial when given half an hour or more before the first morning feeding, with half a glass of water.

For older children the amount of white bread, toast, and potato, should be reduced, and green vegetables, oatmeal, and Graham bread given, with plenty of fruit twice a day. Raw scraped apples are sometimes of more value than any other fruit.

The best suppositories for continuous use are probably the gluten suppositories of the Health Food Company. One should be given the first thing in the morning. They act rather slowly, usually in about two hours. In obstinate cases one may also be used at bedtime. Glycerine suppositories act more quickly, but are too irritating for regular use.

Massage consists in rubbing the abdomen, which may be done in one of two ways: Beginning at the right groin, the hand is carried up to the ribs, then across to the opposite side, then around to the left

groin. The abdomen is stroked gently at first, and afterward deeper pressure used as the child becomes accustomed to it. The second method is by rubbing the deeper parts with a circular movement—the fingers not moving upon the skin—making a series of small circles, beginning at the right groin and following the same course as described above. Either method should be employed for six or eight minutes twice a day, at almost any regular time, except soon after a meal.

DIARRHŒA

In case a child is taken with diarrhœa, what should be done?

With a moderate looseness of the bowels in an older child, solid food should be stopped, and boiled milk given diluted with wheat or barley gruel; the child should be kept in bed, as walking about always aggravates such a disturbance. If the symptoms are more severe and attended by fever and vomiting, all milk should be stopped at once, and only broth, barley water, or some thin gruel given. Some cathartic, usually castor oil, is required with a severe attack. A child of five years should have one tablespoonful; it may be given with orange juice or in soda water, never in milk.

If the patient is an infant, less milk should be used in the formula, the sugar omitted and the fat reduced (see page 93). In severe attacks with frequent foul stools, all food should be stopped for at least twelve hours and all milk for a longer time, and the bowels freely moved by a cathartic.

Why is a cathartic necessary if the movements are already frequent?

Such movements are nearly always due to an irritation in the bowel, set up by the fermenting food which has not been digested. The diarrhœa is Nature's effort to get rid of the irritant. Nothing to stop the movements should be given until the bowels have been thoroughly cleared by the treatment mentioned.

BAD HABITS

What are the most common bad habits of young children?

Sucking, nail-biting, dirt-eating, bed-wetting, and masturbation.

What do children suck?

Most frequently the thumbs or fingers, sometimes the clothing or blanket, often the "pacifier" or rubber nipple.

When is this habit most frequently seen?

It begins in quite early infancy, and if not broken may last until children are six or seven years old.

Is the sucking habit a harmful one?

When persisted in it may produce a misshapen mouth or fingers. It constantly stimulates the flow of saliva and certainly aggravates disturbances of digestion during which the sucking habit is likely to be practised. It may lead to thrush or other forms of infection of the mouth. It is not necessary as a means of quieting a child, though it may in some degree cover up the consequences of bad feeding or bad training. On no account should the habit of sucking the "pacifier" be allowed as a means of putting children to sleep, or of quieting them while restless from dentition or indigestion.

How is the sucking habit to be controlled?

One should be sure in the first place that the constant sucking of fingers is not due to hunger from insufficient food. Sucking of the hands may often be controlled by wearing mittens or fastening the hands to the sides during sleep. In more obstinate cases it may be necessary to confine the elbow by small pasteboard splints to prevent the child from bending the arm so as to get the hand to the mouth.

When are nail-biting and dirt-eating seen, and how are they to be controlled?

These habits belong especially to children over three years old. They are seen particularly in those who are excessively nervous or whose general health is below par; sometimes in those who develop serious nervous diseases later in life. Children with such tendencies should be closely watched, and every means used to break up these habits early. Dirt-eating is a morbid craving which is rarely seen in a normal child.

At what age may a child generally be expected to go without wetting the bed during the night?

Usually at two and a half years, if it is taken up late in the evening. Some children acquire control of the bladder at night when two years old, and a few not until three years. After three years habitual bed-wetting is abnormal.

How should a young child addicted to bed-wetting be managed?

At three or four years of age, punishments are sometimes useful, especially when it seems to depend more upon the child's indifference than anything else. They are of no value in older children, rewards being much more efficacious. In all cases one should give a child plenty of milk and water

early in the day, but no fluids after 4 P. M., the supper being always of solid or semi-solid food. The child should be taken up regularly at ten o'clock or thereabouts. It often happens that the formation or continuance of the habit is due to the child being anæmic or otherwise in poor general condition, to some irritation in the urine, or in the genital organs. Unless the simple means mentioned are successful the child should be placed under the charge of a physician.

What is masturbation?

It is the habit of rubbing the genital organs with the hands, with the clothing, against the bed, or rubbing the thighs together. Sometimes a child sits upon the floor, crosses its thighs tightly and rocks backward and forward. Many of these things are passed over lightly and are regarded for months as simply a "queer trick" of the child. It may be seen at any age, even in those not more than a year old, and in both sexes.

How should such a child be treated?

Masturbation is the most injurious of all the bad habits, and should be broken up just as early as possible. Children should especially be watched at the time of going to sleep and on first waking. Punishments and mechanical restraint are of little avail

except with infants. With older children they usually make matters worse. Rewards are much more efficacious. It is of the utmost importance to watch the child closely, to keep his confidence, and by all possible means to teach self-control.

Some local cause of irritation is often present, which can be removed. Medical advice should at once be sought.

VACCINATION

Nowadays when small-pox occurs so seldom is it necessary to have every child vaccinated?

It should by all means be done. It is only by the practice of general vaccination that small-pox is kept down. In countries or in communities where vaccination is neglected, frightful outbreaks of small-pox occur every now and then just as in olden times.

What is the best time for vaccination?

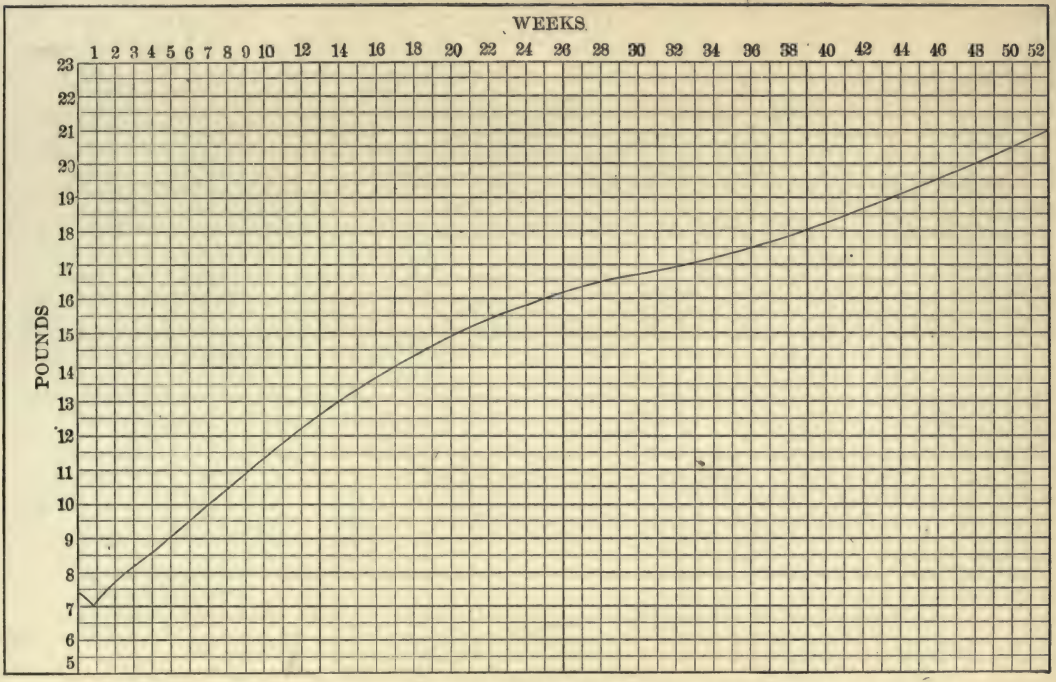
The time usually selected is from the third to the sixth month. It may be deferred in a very delicate child who is not likely to be exposed to small-pox, or in a child suffering from any form of skin disease.

Which is preferable for vaccination, the arm or the leg?

The part which can be most easily protected and kept at rest is to be chosen. In infants who do not yet walk or creep, the leg is to be preferred; in older children, in most circumstances, the arm. If older children are vaccinated on the leg, they should not be allowed to walk much while the vaccination is active.

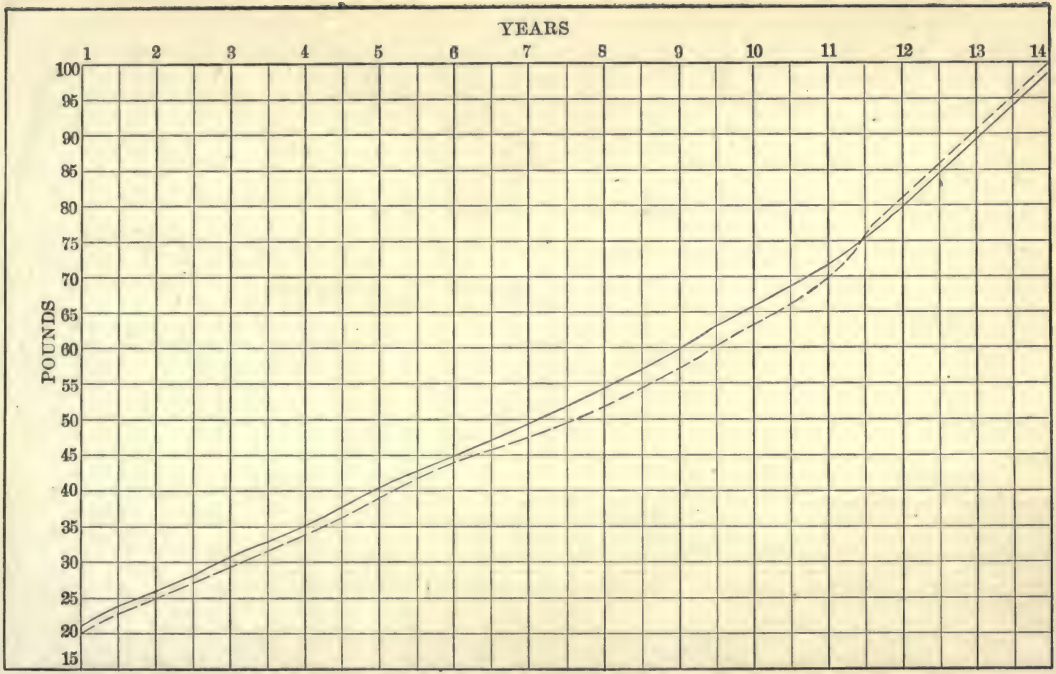
When should vaccination be repeated?

An unsuccessful vaccination proves nothing and should be repeated in two or three weeks. If successfully vaccinated in infancy, a child should invariably be revaccinated before puberty. If exposed or likely to be exposed to small-pox at any time vaccination should be repeated.



Weight chart for the first year; the curved line indicates the average rate of gain.

CHART II



Weight chart, one to fourteen years.
The upper line indicates the average for boys; the lower (dotted) line that for girls.

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